$1.29

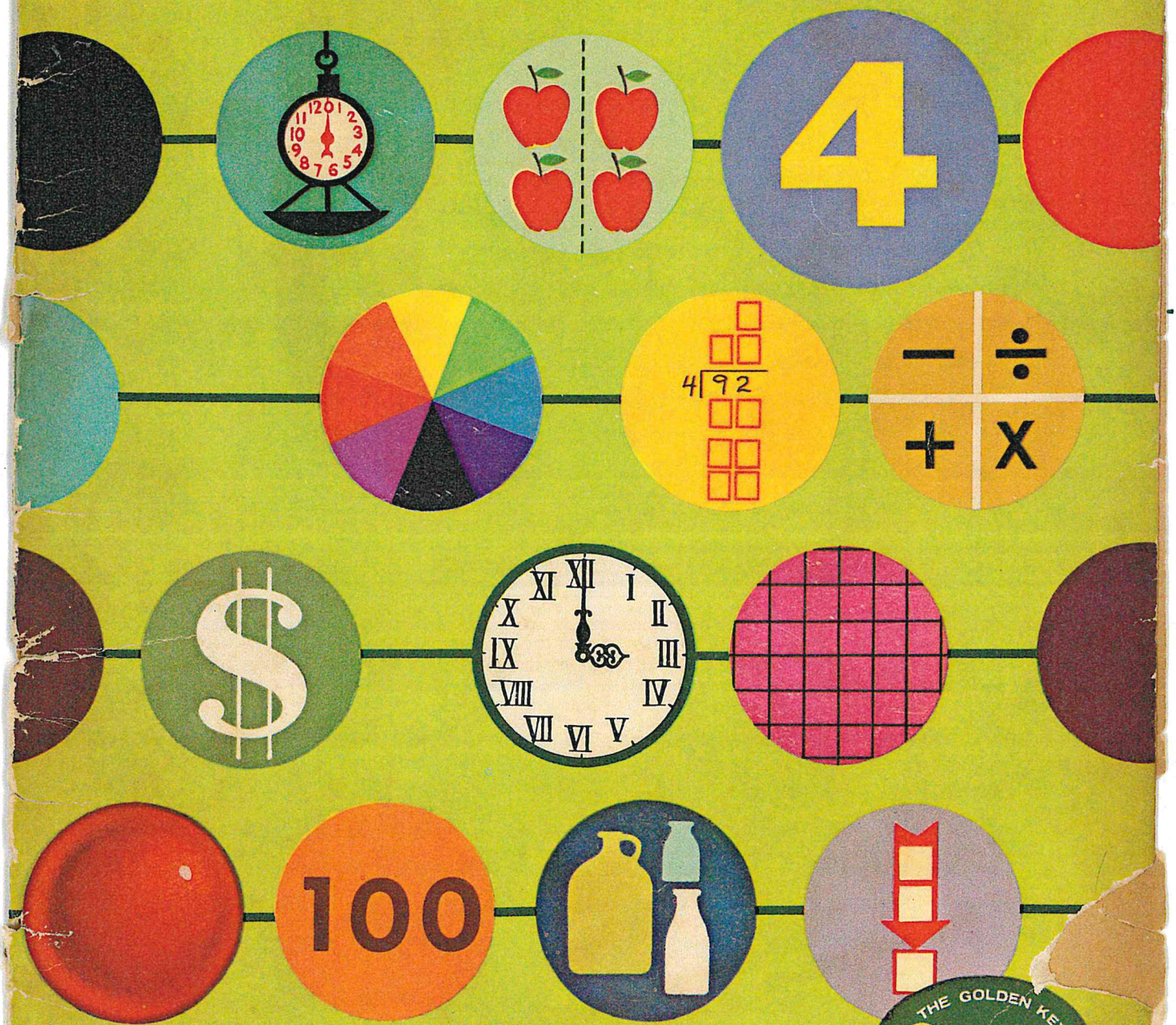
# MATHEMATICS-GRADE 4

240 2.2

## Mastering Multiplication and Division

*A Workbook with Self-Teaching Text and Learning Exercises*

by IRVING ADLER, Ph.D.



## TO THE PARENT AND TEACHER

MATHEMATICS—GRADE 4 is based on a careful study of the methods used to teach mathematics both in this country and abroad. The aim is to develop understanding as a foundation for skill. The book includes the best practices found anywhere and has the freshness and originality that are characteristic of all the author's books.

The chief feature of this book is the gradual extension to higher numbers of the basic concepts developed in Books 1, 2, and 3. The concept of place-value is carried through 100,000. Addition and subtraction of three-digit numbers are taught. Multiplication of a three-digit number by a single digit is developed. Division proceeds as far as the division of two-digit numbers by a single digit. Symbols for fractions are introduced, and the first steps in the addition and subtraction of fractions are taken.

Other concepts and skills developed include: approximation and estimation; Roman numerals through 50; money equivalents and making change up to $5; the thermometer; linear measure (inches, feet, yards); the clock and calendar; liquid measure (gallons, quarts, pints, half-pints); weights (pounds and ounces).

To strengthen his understanding of number ideas, each child should work with objects and groups of objects in the ways suggested by the exercises in the book. A kit of suitable objects for this purpose includes: several strings of beads, with ten beads on each string; pennies, nickels, dimes, quarters, half-dollars, and dollars; cardboard squares, strips containing ten squares in a row, and square arrays of 100 squares, arranged in ten rows with 10 in each row; checkers, buttons, bottle caps; circles cut into equal sectors; etc.

## ABOUT THE AUTHOR

Irving Adler received his Ph.D. in pure mathematics at Columbia University. He was a teacher in the New York schools for twenty years, including six years as chairman of a high-school mathematics department. Dr. Adler has taught at Columbia University and Bennington College, and was the keynote speaker at the Washington conference of state supervisors of mathematics, called by the U. S. Office of Education in June, 1961. He is the author of about fifty books on mathematics, science, and education, and co-author of thirty more.

# MATHEMATICS–GRADE 4

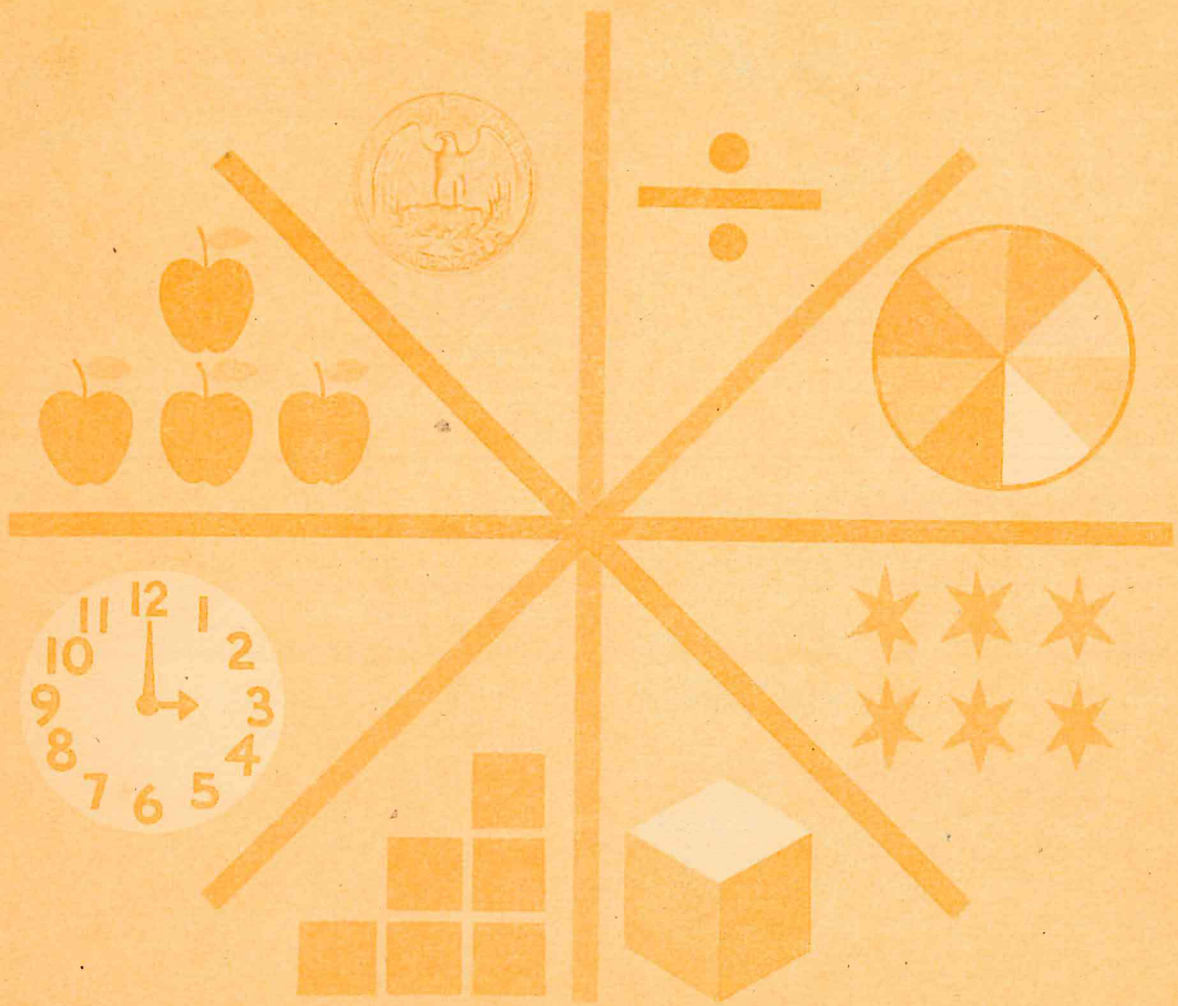
## Mastering Multiplication and Division

*A Workbook with Self-Teaching Text and Learning Exercises*


**by IRVING ADLER, Ph.D.**

Author of *The Giant Golden Book of Mathematics*, *The New Mathematics*, and *Magic House of Numbers*

**Illustrated by Lowell Hess**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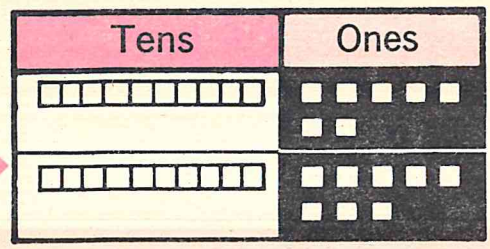
Thirty-fifth Printing, 1982

# Adding Tens and Ones with Exchange

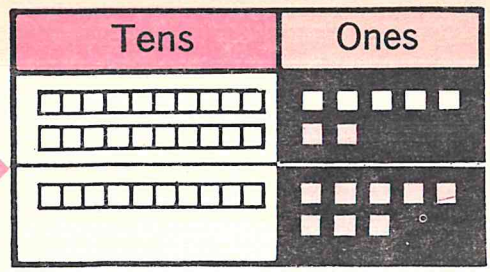
First add the tens and ones separately. Then if there are more than nine ones, exchange ten ones for one ten.

**Example** Add 17 + 18.

Before the exchange



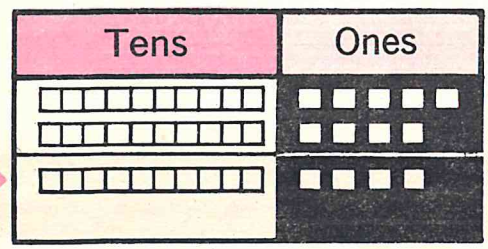

After the exchange



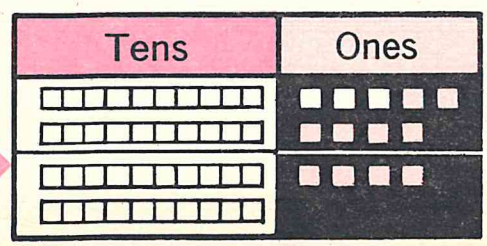

17 = 1 ten + 7 ones
18 = 1 ten + 8 ones
17 + 18 = 2 tens + 15 ones
= 3 tens + 5 ones = ☐

Add 29 + 14.

Before the exchange




After the exchange




29 = 2 tens + 9 ones
14 = 1 ten + 4 ones
29 + 14 = 3 tens + 13 ones
= ☐ tens + 3 ones = ☐

37 = 3 tens + 7 ones
26 = 2 tens + 6 ones
37 + 26 = ☐ tens + 13 ones
= ☐ tens + 3 ones = ☐

16 = 1 ten + 6 ones
48 = 4 tens + 8 ones
16 + 48 = ☐ tens + ones
= ☐ tens + ones = ☐

## A Short Way of Adding

| Step 1 | | Step 2 | | Step 3 | |
|---|---|---|---|---|---|
| Tens | Ones | Tens | Ones | Tens | Ones |
| | | 1 | | 1 | |
| 1 | 5 | 1 | 5 | 1 | 5 |
| +2 | 7 | +2 | 7 | +2 | 7 |
| Think | | | | | |
| 5 + 7 = 12 | | | 2 | 4 | 2 |
| 12 = 1 ten | | | | | |
| + 2 | | | | | |

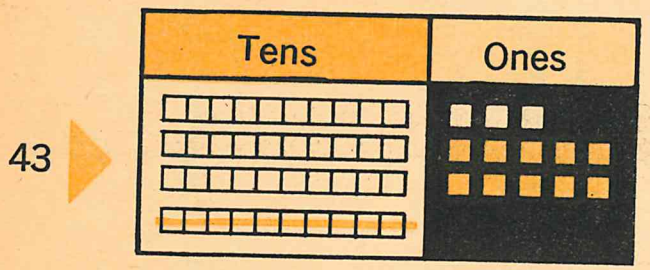
Add in the short way.

| | | |
|---|---|---|
| 36 | 46 | 23 |
| + 29 | + 17 | + 58 |
| 62 | 54 | 23 |
| + 19 | + 27 | + 29 |
| 17 | 16 | 18 |
| + 15 | + 16 | + 18 |

# Subtracting Tens and Ones with Exchange



Take away 17 from 43.
43 = 4 tens + 3 ones
17 = 1 ten + 7 ones
To take away 17 we must take away 1 ten and 7 ones.




To have enough ones so that we can take away 7 ones, exchange one ten for ten ones. The exchange is in orange: Cross out a ten and draw 10 ones.
After the exchange,

43 = 3 tens + 13 ones
17 = 1 ten + 7 ones
43 − 17 = 2 tens + 6 ones = ☐

First exchange 1 ten for 10 ones.
Then subtract.
Subtract 75 − 26.

75 = ☐ tens + ☐ ones
75 = ☐ tens + ☐ ones
26 = ☐ tens + ☐ ones
75 − 26 = ☐ tens + ☐ ones = ☐

Subtract 52 − 19.

52 = ☐ tens + ☐ ones
52 = ☐ tens + ☐ ones
19 = ☐ ten + ☐ ones
52 − 19 = ☐ tens + ☐ ones = ☐

Subtract 34 − 18.

34 = ☐ tens + ☐ ones
34 = ☐ tens + ☐ ones
18 = ☐ ten + ☐ ones
34 − 18 = ☐ tens + ☐ ones = ☐

## A Short Way of Subtracting

42 − 17

| Tens | Ones |
|---|---|
| 3 | 12 |
| ~~4~~ | 2 |
| − 1 | 7 |
| 2 | 5 |

To be able to take away 7 ones, change 4 tens + 2 ones into 3 tens + 12 ones.

Then think, "Take 7 from 12, and take 1 ten from 3 tens."

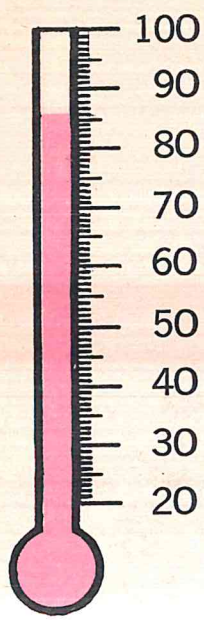
Subtract in the short way. Exchange a ten for ten ones if you have to.

| | | |
|---|---|---|
| 8 2<br>− 3 5<br>☐ | 6 1<br>− 3 7<br>☐ | 4 8<br>− 2 9<br>☐ |
| 5 0<br>− 1 5<br>☐ | 4 8<br>− 1 6<br>☐ | 8 2<br>− 4 8<br>☐ |
| 4 4<br>− 1 7<br>☐ | 5 6<br>− 2 8<br>☐ | 3 0<br>− 1 8<br>☐ |

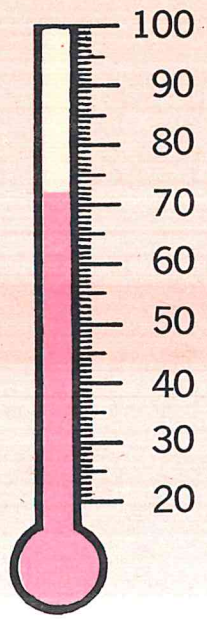
# Thermometers

The top edge of the liquid in each tube shows the temperature.

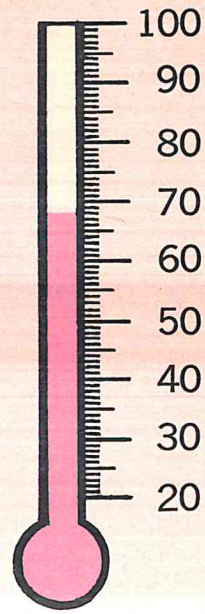
Write down the temperature shown by each thermometer.



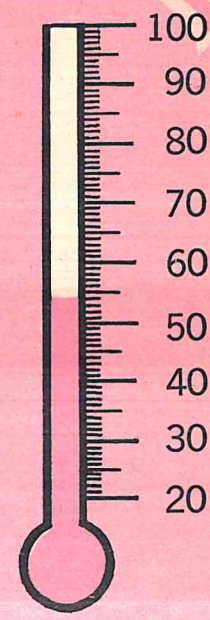

☐ degrees




☐ degrees




☐ degrees




☐ degrees

We have a short way of writing degrees, like this:

45° = 45 degrees.

81° = 81 degrees.

Write these temperatures in the short way:

64 degrees = ☐

91 degrees = ☐

Water freezes at 32°. We call this the **freezing** temperature.

When the temperature is 38°, it is ☐ degrees above freezing.

When the temperature is 28°, it is ☐ degrees below freezing.

On Monday the temperature was 62°. On Tuesday the temperature was 75°.

Tuesday's temperature was ☐ degrees higher than Monday's temperature.

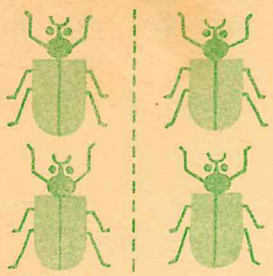
While the temperature was 92° in the city, it was 86° at the beach. It was ☐ degrees cooler at the beach.

If the temperature fell 12° from a high of 84°, what was the temperature it fell to?

Answer: ☐

# Twos



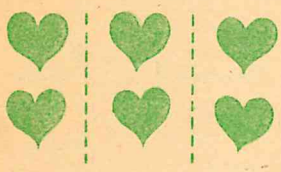


2 + 2 = ☐

2 twos = ☐

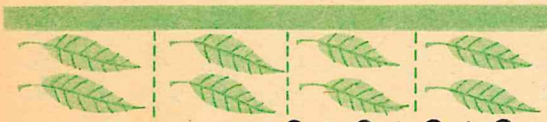
2 X 2 = ☐

2 + 2 + 2 = ☐



3 twos = ☐

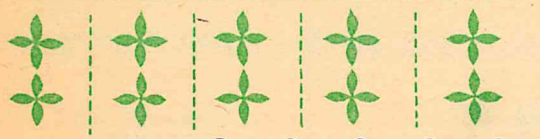
3 X 2 = ☐



2 + 2 + 2 + 2 = ☐

4 twos = ☐

4 X 2 = ☐



2 + 2 + 2 + 2 + 2 = ☐

5 twos = ☐

5 X 2 = ☐

6 twos = 3 twos + 3 twos

= ☐ + ☐ = ☐

6 twos = ☐

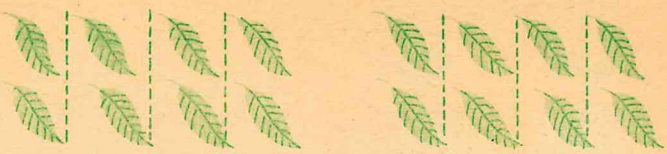
6 X 2 = ☐

7 twos = 4 twos + 3 twos

= ☐ + ☐ = ☐

7 twos = ☐

7 X 2 = ☐



8 twos = 4 twos + 4 twos

= ☐ + ☐ = ☐

8 twos = ☐

8 X 2 = ☐

9 twos = 3 twos + 3 twos + 3 twos

= ☐ + ☐ + ☐

9 twos = ☐

9 X 2 = ☐

10 twos = 5 twos + 5 twos

= ☐ + ☐ = ☐

10 twos = ☐

10 X 2 = ☐

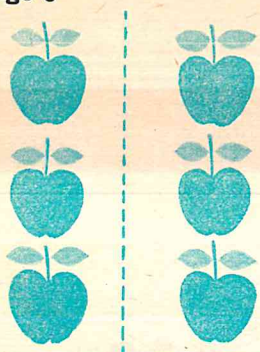
1 two = ☐

1 X 2 = ☐

| | |
|---|---|
| 1 X 2 = | 6 X 2 = |
| 2 X 2 = | 7 X 2 = |
| 3 X 2 = | 8 X 2 = |
| 4 X 2 = | 9 X 2 = |
| 5 X 2 = | 10 X 2 = |

| | |
|---|---|
| 3 X 2 = | 5 X 2 = |
| 8 X 2 = | 1 X 2 = |
| 6 X 2 = | 7 X 2 = |
| 10 X 2 = | 9 X 2 = |
| 4 X 2 = | 2 X 2 = |

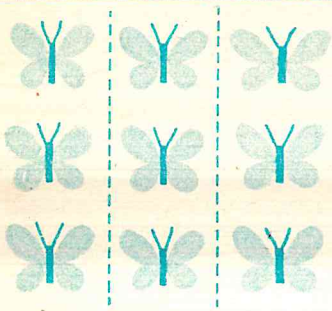
# Threes



3 + 3 = ☐

2 threes = ☐

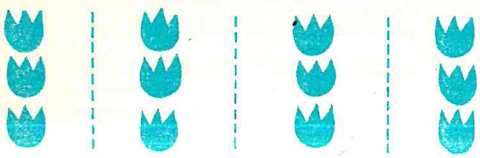
2 X 3 = ☐



3 + 3 + 3 = ☐

3 threes = ☐

3 X 3 = ☐



3 + 3 + 3 + 3 = ☐

4 threes = ☐ 4 X 3 = ☐

3 + 3 + 3 + 3 + 3 = ☐

5 threes = ☐ 5 X 3 = ☐

6 threes = 5 threes + 3

= ☐ + 3 = ☐

6 threes = ☐ 6 X 3 = ☐

7 threes = 6 threes + 3

= ☐ + 3 = ☐

7 threes = ☐ 7 X 3 = ☐

8 threes = 4 threes + 4 threes

= ☐ + ☐ = ☐

8 threes = ☐ 8 X 3 = ☐

9 threes = 6 threes + 3 threes

= ☐ + ☐ = ☐

9 threes = ☐ 9 X 3 = ☐

10 threes = 5 threes + 5 threes

= ☐ + ☐ = ☐

10 threes = ☐ 10 X 3 = ☐

1 three = ☐ 1 X 3 = ☐

| | |
|---|---|
| 1 X 3 = ☐ | 6 X 3 = ☐ |
| 2 X 3 = ☐ | 7 X 3 = ☐ |
| 3 X 3 = ☐ | 8 X 3 = ☐ |
| 4 X 3 = ☐ | 9 X 3 = ☐ |
| 5 X 3 = ☐ | 10 X 3 = ☐ |
| 3 X 3 = ☐ | 5 X 3 = ☐ |
| 8 X 3 = ☐ | 1 X 3 = ☐ |
| 6 X 3 = ☐ | 7 X 3 = ☐ |
| 10 X 3 = ☐ | 9 X 3 = ☐ |
| 4 X 3 = ☐ | 2 X 3 = ☐ |

# Fours

1 four-cent stamp costs 4¢.

1 four = ☐ 1 X 4 = ☐

2 four-cent stamps cost 4¢ + 4¢, or ☐ ¢.

2 fours = ☐ 2 X 4 = ☐

3 fours = 4 + 4 + 4 = ☐

3 fours = ☐ 3 X 4 = ☐

4 fours = 4 + 4 + 4 + 4 = ☐

4 fours = ☐ 4 X 4 = ☐

5 fours = 4 fours + 4

= ☐ + 4 = ☐

5 fours = ☐ 5 X 4 = ☐

6 fours = 5 fours + 4

= ☐ + 4 = ☐

6 fours = ☐ 6 X 4 = ☐

7 fours = 6 fours + 4

= ☐ + 4 = ☐

7 fours = ☐ 7 X 4 = ☐

8 fours = 4 fours + 4 fours

= ☐ + ☐ = ☐

8 fours = ☐ 8 X 4 = ☐

9 fours = 8 fours + 4

= ☐ + 4 = ☐

9 fours = ☐ 9 X 4 = ☐

10 fours = 9 fours + 4

= ☐ + 4 = ☐

10 fours = ☐ 10 X 4 = ☐

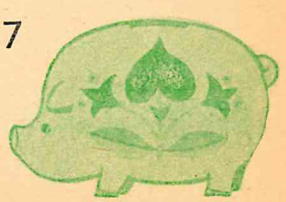
| | | | | |
|---|---|---|---|---|
| 4 X 1 = | 4 X 2 = | 4 X 3 = | 4 X 4 = | 4 X 5 = |
| | | | | |
| 4 X 6 = | 4 X 7 = | 4 X 8 = | 4 X 9 = | 4 X 10 = |
| | | | | |

| | |
|---|---|
| 3 X 4 = | 5 X 4 = |
| 8 X 4 = | 1 X 4 = |
| 6 X 4 = | 7 X 4 = |
| 10 X 4 = | 9 X 4 = |
| 4 X 4 = | 2 X 4 = |

If 1 pencil costs 4¢, then 3 pencils cost ☐ ¢.

If 1 skate has 4 wheels, then 5 skates together have ☐ wheels.

Tom saved 4¢ a week for 7 weeks. He saved ☐ ¢ in that time.



If 1 apple costs 4¢, then 8 apples cost ☐ ¢.

# Fives

1 nickel is worth 5¢.

1 five = ☐ 1 X 5 = ☐

2 nickels are worth 5¢ + 5¢, or ☐ ¢.

2 fives = ☐ 2 X 5 = ☐

3 fives = 5 + 5 + 5 = ☐

3 fives = ☐ 3 X 5 = ☐

4 fives = 5 + 5 + 5 + 5 = ☐

4 fives = ☐ 4 X 5 = ☐

5 fives = 4 fives + 5

= ☐ + 5 = ☐

5 fives = ☐ 5 X 5 = ☐

6 fives = 5 fives + 5

= ☐ + 5 = ☐

6 fives = ☐ 6 X 5 = ☐

7 fives = 6 fives + 5

= ☐ + 5 = ☐

7 fives = ☐ 7 X 5 = ☐

8 fives = 4 fives + 4 fives

= ☐ + ☐ = ☐

8 fives = ☐ 8 X 5 = ☐

9 fives = 8 fives + 5

= ☐ + 5 = ☐

9 fives = ☐ 9 X 5 = ☐

10 fives = 9 fives + 5

= ☐ + 5 = ☐

10 fives = ☐ 10 X 5 = ☐

| | | | | |
|---|---|---|---|---|
| 5 X1 = ☐ | 5 X2 = ☐ | 5 X3 = ☐ | 5 X4 = ☐ | 5 X5 = ☐ |
| 5 X6 = ☐ | 5 X7 = ☐ | 5 X8 = ☐ | 5 X9 = ☐ | 5 X10 = ☐ |

3 X 5 = ☐ 5 X 5 = ☐

8 X 5 = ☐ 1 X 5 = ☐

6 X 5 = ☐ 7 X 5 = ☐

10 X 5 = ☐ 9 X 5 = ☐

4 X 5 = ☐ 2 X 5 = ☐

Mary saved 5¢ a week for 8 weeks. She saved ☐ ¢ in that time.

Six 5¢ candy bars cost ☐ ¢ altogether.

There are 5 school days in a week. There are ☐ school days in 4 weeks.

If 1 apple costs 5¢, then 3 apples cost ☐ ¢.

## One Times a Number

3 X 2 = ☐ 2 X 2 = ☐ 1 X 2 = ☐

1 X 3 = ☐ 1 X 4 = ☐ 1 X 5 = ☐

1 times a number equals that number.

| | |
|---|---|
| 1 X 6 = ☐ | 1 X 11 = ☐ |
| 1 X 7 = ☐ | 1 X 12 = ☐ |
| 1 X 8 = ☐ | 1 X 13 = ☐ |
| 1 X 9 = ☐ | 1 X 14 = ☐ |
| 1 X 10 = ☐ | 1 X 15 = ☐ |

## A Number Times One

3 X 1 = ☐ 2 X 1 = ☐ 1 X 1 = ☐

1 + 1 + 1 + 1 = ☐ 4 X 1 = ☐

1 + 1 + 1 + 1 + 1 = ☐ 5 X 1 = ☐

| | |
|---|---|
| 6 X 1 = ☐ | 11 X 1 = ☐ |
| 7 X 1 = ☐ | 12 X 1 = ☐ |
| 8 X 1 = ☐ | 13 X 1 = ☐ |
| 9 X 1 = ☐ | 14 X 1 = ☐ |
| 10 X 1 = ☐ | 15 X 1 = ☐ |

## Checking Subtraction

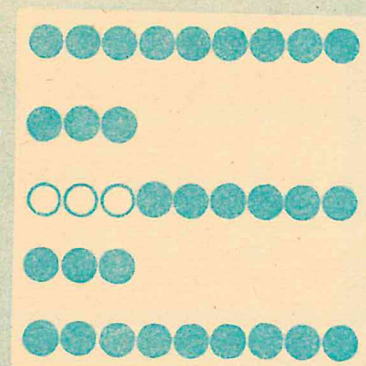
9

If you take away 3,

you get 6.

If you put back the 3,

you get 9 again.



$\begin{array}{r} 9 \\ -\ 3 \\ \hline 6 \end{array}$ Check by adding these. $\begin{array}{r} 6 \\ +\ 3 \\ \hline 9 \end{array}$ You get the number you had at first.

The class was asked to find 8 – 5.

John did this:

$\begin{array}{r} 8 \\ -\ 5 \\ \hline 2 \end{array}$ Check by adding these. $\begin{array}{r} 2 \\ +\ 5 \\ \hline 7 \end{array}$ He did not get 8. His answer is wrong.

Mary did this:

$\begin{array}{r} 8 \\ -\ 5 \\ \hline 3 \end{array}$ Check by adding these. $\begin{array}{r} 3 \\ +\ 5 \\ \hline 8 \end{array}$ She did get 8. Her answer is right.

Subtract. Then check your answer.

$\begin{array}{r} 45 \\ -\ 12 \\ \hline \phantom{0} \end{array}$ Check by adding these. $+\ 12$

$\begin{array}{r} 52 \\ -\ 19 \\ \hline \phantom{0} \end{array}$ Check by adding these. $+\ 19$

$\begin{array}{r} 57 \\ -\ 24 \\ \hline \phantom{0} \end{array}$ Check by adding these. $+\ 24$

$\begin{array}{r} 61 \\ -\ 27 \\ \hline \phantom{0} \end{array}$ Check by adding these. $+\ 27$

# Dividing into Groups of Two

The lines divide these 10 stars into groups of two stars.
There are 5 groups of two stars in 10 stars.
There are 5 twos in 10.
10 divided by 2 = 5.
÷ means "divided by."
10 ÷ 2 = 5 5 X 2 = 10

---

Draw lines to divide these 6 stars into groups of two.

There are ☐ twos in 6.
6 ÷ 2 = ☐ ☐ X 2 = 6

---

Draw a line to divide these 4 stars into groups of two.

There are ☐ twos in 4.
4 ÷ 2 = ☐ ☐ X 2 = 4

---

Draw lines to divide these 8 stars into groups of two.

There are ☐ twos in 8.
8 ÷ 2 = ☐ ☐ X 2 = 8

---

4 ÷ 2 = ☐ 8 ÷ 2 = ☐
6 ÷ 2 = ☐ 10 ÷ 2 = ☐

---

Here are two stars. This is enough to make only 1 group of two stars.

There is ☐ two in 2.
2 ÷ 2 = ☐ ☐ X 2 = 2

---

Draw lines to divide these 12 stars into groups of two.

There are ☐ twos in 12.
12 ÷ 2 = ☐ ☐ X 2 = 12

---

Draw lines to divide these 14 stars into groups of two.

There are ☐ twos in 14.
14 ÷ 2 = ☐ ☐ X 2 = 14

---

☐ X 2 = 16 16 ÷ 2 = ☐
☐ X 2 = 18 18 ÷ 2 = ☐
☐ X 2 = 20 20 ÷ 2 = ☐

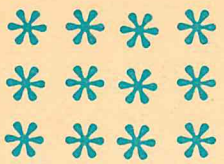
---

4 ÷ 2 = ☐ 6 ÷ 2 = ☐
10 ÷ 2 = ☐ 2 ÷ 2 = ☐
16 ÷ 2 = ☐ 12 ÷ 2 = ☐
20 ÷ 2 = ☐ 8 ÷ 2 = ☐
14 ÷ 2 = ☐ 18 ÷ 2 = ☐

# Dividing into Groups of Three

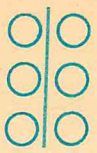


Draw lines to divide these 12 stars into groups of three.



There are ☐ threes in 12.

12 ÷ 3 = ☐ ☐ X 3 = 12

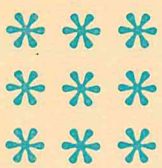


Here are some circles drawn in groups of three. Draw more circles in groups of three until there are 18 circles altogether.

There are ☐ threes in 18.

18 ÷ 3 = ☐ ☐ X 3 = 18

Draw lines to divide these 9 stars into groups of three.



There are ☐ threes in 9.

9 ÷ 3 = ☐ ☐ X 3 = 9

Draw lines to divide these 6 stars into groups of three.

There are ☐ threes in 6.

6 ÷ 3 = ☐ ☐ X 3 = 6

Draw circles here in groups of three until there are 21 circles in all.

There are ☐ threes in 21.

21 ÷ 3 = ☐ ☐ X 3 = 21

How many groups of three will these 3 stars make?

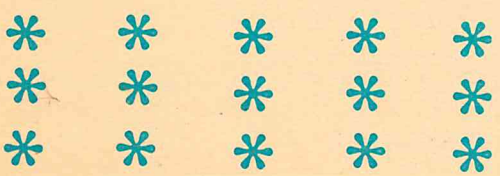
Answer: ☐ group

3 ÷ 3 = ☐ ☐ X 3 = 3

Draw circles here in groups of three until there are 24 circles in all.

There are ☐ threes in 24.

24 ÷ 3 = ☐ ☐ X 3 = 24



Draw lines to divide these 15 stars into groups of three.

There are ☐ threes in 15.

15 ÷ 3 = ☐ ☐ X 3 = 15

☐ X 3 = 27

☐ X 3 = 30

27 ÷ 3 = ☐

30 ÷ 3 = ☐

3 ÷ 3 = ☐

6 ÷ 3 = ☐

9 ÷ 3 = ☐

12 ÷ 3 = ☐

15 ÷ 3 = ☐

18 ÷ 3 = ☐

21 ÷ 3 = ☐

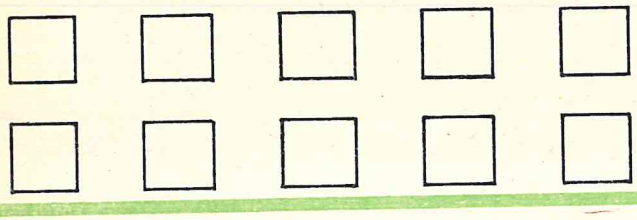
24 ÷ 3 = ☐

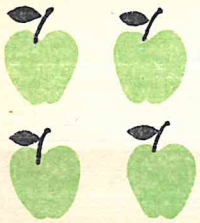
27 ÷ 3 = ☐

30 ÷ 3 = ☐

# Dividing into Groups of Four

Count by fours up to 40.



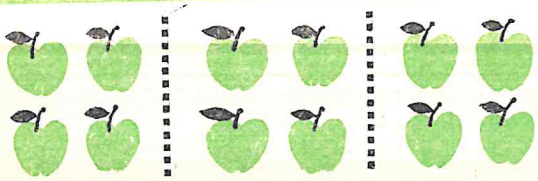


There are ☐ apples here.

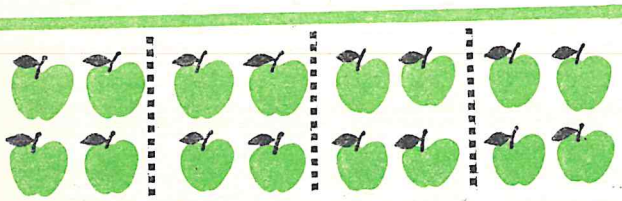
There is ☐ group of 4.

☐ apples

☐ groups of 4



☐ apples ☐ groups of 4



☐ apples ☐ groups of 4

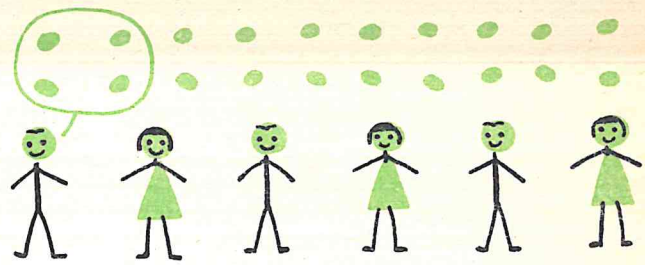
There is ☐ four in 4.

There are ☐ fours in 8.

There are ☐ fours in 12.

There are ☐ fours in 16.

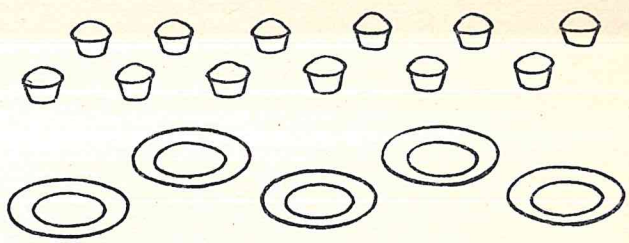
| | |
|---|---|
| ☐ X 4 = 4 | 4 ÷ 4 = ☐ |
| ☐ X 4 = 8 | 8 ÷ 4 = ☐ |
| ☐ X 4 = 12 | 12 ÷ 4 = ☐ |
| ☐ X 4 = 16 | 16 ÷ 4 = ☐ |
| ☐ X 4 = 20 | 20 ÷ 4 = ☐ |
| ☐ X 4 = 24 | 24 ÷ 4 = ☐ |
| ☐ X 4 = 28 | 28 ÷ 4 = ☐ |
| ☐ X 4 = 32 | 32 ÷ 4 = ☐ |
| ☐ X 4 = 36 | 36 ÷ 4 = ☐ |
| ☐ X 4 = 40 | 40 ÷ 4 = ☐ |



Here are 20 jelly beans and some children. Divide the jelly beans into groups of four by drawing a loop around each group. Give each group to a child by joining the loop around the group to the child.

There are ☐ fours in 20.

There are enough jelly beans for ☐ children.

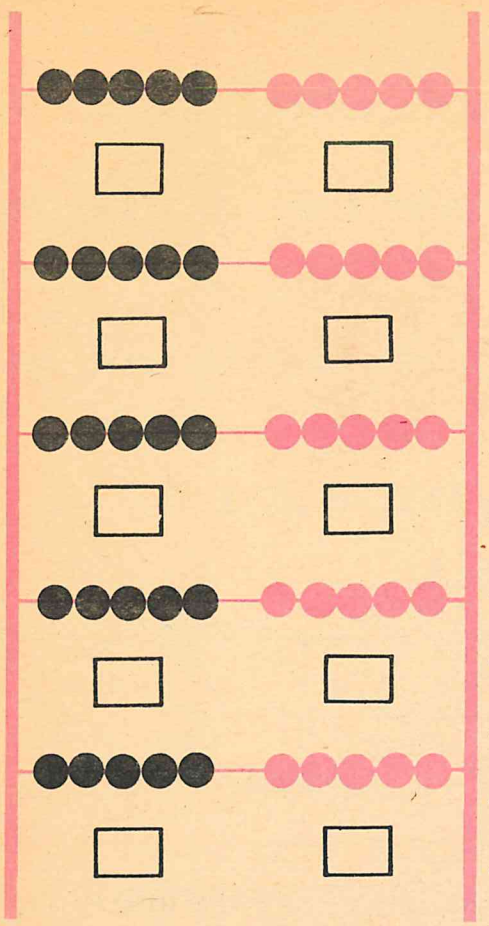


There are 12 cakes here. Divide them into groups of 4 by drawing a loop around each group. Put each group on a plate by joining the loop to a plate.

There are ☐ fours in 12.

☐ plates are needed.

# Dividing into Groups of Five



Count these beads by fives.
As you count, write the numbers you say in the boxes below the beads.

| | |
|---|---|
| There is ☐ five in 5. | 5 ÷ 5 = ☐ |
| There are ☐ fives in 10. | 10 ÷ 5 = ☐ |
| There are ☐ fives in 15. | 15 ÷ 5 = ☐ |
| There are ☐ fives in 20. | 20 ÷ 5 = ☐ |
| There are ☐ fives in 25. | 25 ÷ 5 = ☐ |
| There are ☐ fives in 30. | 30 ÷ 5 = ☐ |
| There are ☐ fives in 35. | 35 ÷ 5 = ☐ |
| There are ☐ fives in 40. | 40 ÷ 5 = ☐ |
| There are ☐ fives in 45. | 45 ÷ 5 = ☐ |
| There are ☐ fives in 50. | 50 ÷ 5 = ☐ |

A quarter is worth 25¢.
A nickel is worth 5¢.

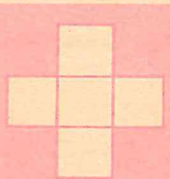
There are ☐ fives in 25.

A quarter is worth ☐ nickels.

A class of 30 children sat down in rows of seats. There were 5 seats in each row.

There are ☐ fives in 30.

The class filled ☐ rows.



Five square tiles arranged in this way form a Greek cross.

35 tiles will make ☐ crosses.

A half dollar is worth 50¢.

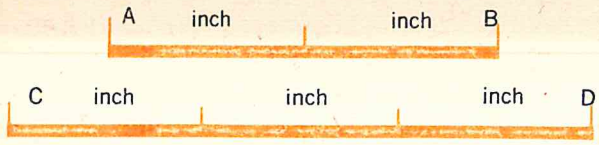
There are ☐ fives in 50.

A half dollar is worth ☐ nickels.

| | |
|---|---|
| 15 ÷ 5 = ☐ | 10 ÷ 5 = ☐ |
| 35 ÷ 5 = ☐ | 20 ÷ 5 = ☐ |
| 50 ÷ 5 = ☐ | 30 ÷ 5 = ☐ |
| 45 ÷ 5 = ☐ | 5 ÷ 5 = ☐ |
| 25 ÷ 5 = ☐ | 40 ÷ 5 = ☐ |

# Inches, Feet, and Yards

This is an **inch.**







The line AB is ☐ inches long.

The line CD is ☐ inches long.

A length of 12 inches is called a **foot.**

There are ☐ twos in 12.

How many two-inch lengths make 1 foot? ☐ Answer: ☐

There are ☐ threes in 12.

How many three-inch lengths make 1 foot? ☐ Answer: ☐

There are ☐ fours in 12.

How many four-inch lengths make 1 foot? ☐ Answer: ☐

$$\begin{array}{r} 12 \\ +\ 12 \\ \hline \square \end{array}$$

Two feet contain 12 inches + 12 inches.

2 feet = ☐ inches

**in.** is a short way to write inches.

**ft.** is a short way to write feet.

2 in. means 2 inches.

3 in. means 3 _____.

2 ft. means 2 _____.

3 ft. means 3 _____.

2 ft. 6 in. means a length of 2 _____ and 6 _____.

A length of three feet is called a **yard.**

**yd.** is a short way to write yard.

A ruler one yard long is called a **yardstick.**

Lengths of cloth are usually measured in yards.

1 yard = 12 in. + 12 in. + 12 in.

$12 = 10 + 2$

$12+12+12 = 10+10+10+2+2+2$

$12 + 12 + 12 =$ ☐

1 yard = ☐ inches

A 6-foot length can be divided into ☐ 3-foot lengths.

Each 3-foot length is 1 yard.

So 6 feet = ☐ yards.

A 9-foot length can be divided into ☐ 3-foot lengths.

So 9 feet = ☐ yards.

A 12-foot length can be divided into ☐ 3-foot lengths.

So 12 feet = ☐ yards.

1 yard = 3 feet

2 yd. = 2 × 3 feet = ☐ ft.

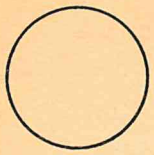
3 yd. = 3 × 3 feet = ☐ ft.

4 yd. = 4 × 3 feet = ☐ ft.

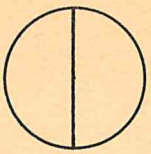
5 yd. = 5 × 3 feet = ☐ ft.

# Halves, Fourths, and Thirds





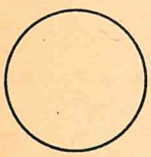
a whole pie



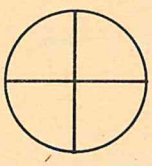
a pie cut in half

1 whole = ☐ halves

---



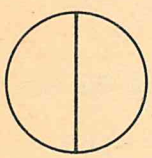
a whole pie

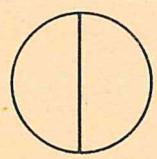


a pie cut into fourths

1 whole = ☐ fourths

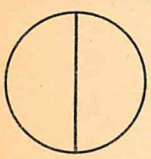
---

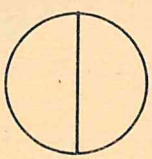


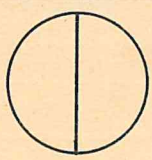


2 wholes = ☐ halves

---







3 wholes = ☐ halves

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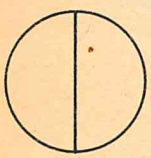
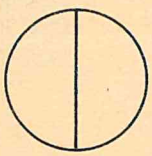
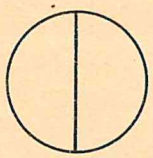


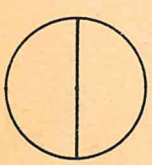


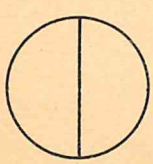


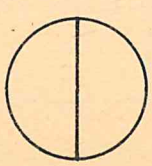
Color the first 3 halves.

3 halves = ☐ whole and ☐ half

---



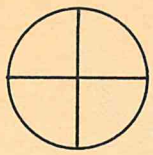




Color the first 5 halves.

5 halves = ☐ wholes and ☐ half

---



Color half of the pie.

1 half = ☐ fourths

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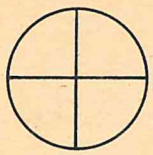
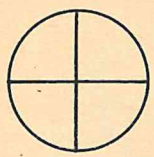


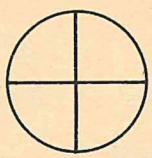
Color 3 fourths of the pie.

☐ fourth is not colored.

3 fourths = ☐ half and ☐ fourth

---

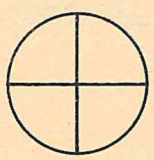


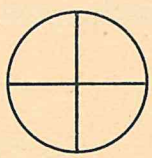


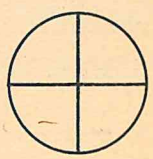
2 wholes =

☐ fourths

---

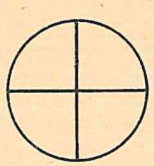


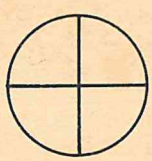




3 wholes = ☐ fourths

---





Color

6 fourths.

6 fourths = ☐ whole and ☐ half

---

a pie cut into thirds

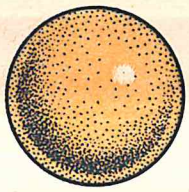
1 whole = ☐ thirds

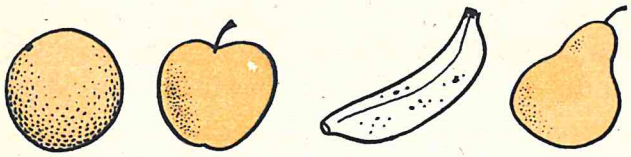
---

2 wholes = ☐ thirds

## Spheres and Hemispheres

A ball is a **sphere.**

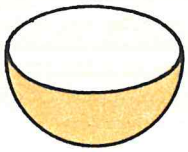




orange apple banana pear

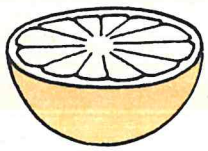
Which fruit is most like a sphere?
Circle it.

Half of a sphere is called a **hemisphere.**

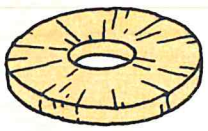


Circle those desserts that are shaped like hemispheres.

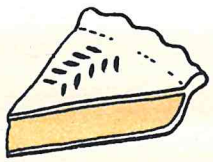
half of a grapefruit



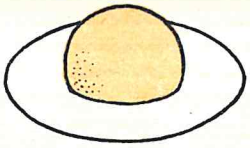
a slice of pineapple

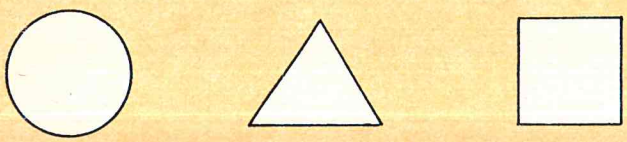


a slice of pie



a scoop of ice cream

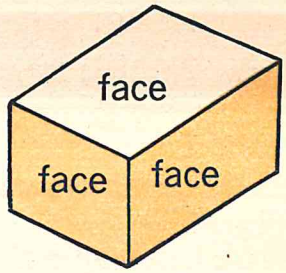




circle triangle square

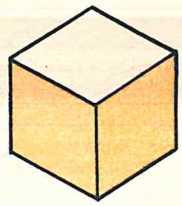
Color the figure that looks like the flat face of a hemisphere.

## Rectangular Solids and Cubes




A box is a **rectangular solid.**

All the faces are rectangles.
The length, width, and height may be different sizes.



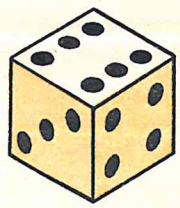
If the length, width, and height are the same size, the rectangular solid is a **cube.**

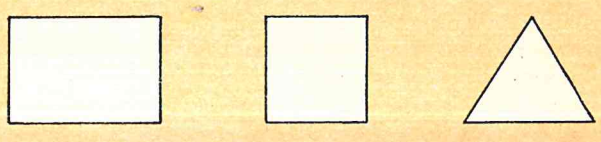
Circle those rectangular solids that are cubes.

alphabet block

cereal box

die





rectangle square triangle

Color the figure that looks like a flat face of a cube.

A half dollar is worth 50¢.

☐ fives = 50

1 half dollar = ☐ nickels

☐ tens = 50

1 half dollar = ☐ dimes

Use real coins or some of the coin pictures below to count out the following sums of money. Do this by counting 50¢ for a half dollar, 25¢ for each quarter, 10¢ for each dime, 5¢ for each nickel, and 1¢ for each penny you use. Then write down in the blank boxes the number of coins of each kind that you use.

**Example** Count out 32¢.

Choose a quarter and say **25.**
Choose a nickel and say **30.**
Choose a penny and say **31.**
Choose another penny and say **32.**
32¢ = 1 quarter and 1 nickel and 2 pennies

70¢ = ☐ half dollar and ☐ dimes

40¢ = ☐ quarter and ☐ dime and ☐ nickel

38¢ = ☐ dimes and ☐ nickel and ☐ pennies

38¢ = ☐ quarter and ☐ dime and ☐ pennies

85¢ = ☐ half dollar and ☐ quarter and ☐ dime

99¢ = ☐ half dollar and ☐ quarter and ☐ dimes and ☐ pennies

90¢ = ☐ quarters and ☐ dimes and 2 nickels

64¢ = ☐ half dollar and ☐ dime and ☐ pennies

80¢ = ☐ half dollar and ☐ quarter and ☐ nickel

# Making Change

Each purchase below was paid for with a half dollar. Use real coins or the coin pictures below to make change.

Price: 38¢

**Example** The price is 38¢. Count from 38 to 50 in this way:

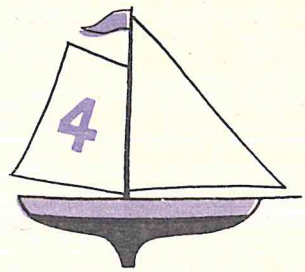
38 39 40 50

Use: penny penny dime

You use 2 pennies and 1 dime for change.
The change is worth 12¢.

Each purchase below was paid for with 3 quarters. Count out the change.

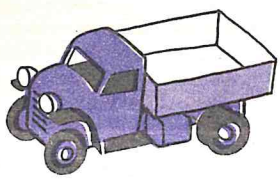
3 quarters = ☐ ¢.




Use ☐ pennies
and ☐ dime
and ☐ nickel
for change.

Price: 57¢

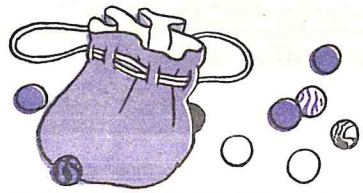
The change is worth ☐ ¢.



Use ☐ pennies
and ☐ nickel
for change.

Price: 42¢

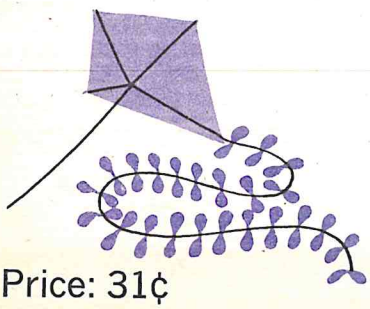
The change is worth ☐ ¢.



Use ☐ pennies
and ☐ dime
for change.

Price: 61¢

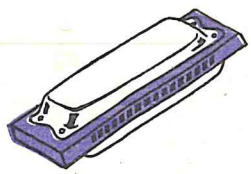
The change is worth ☐ ¢.



Use ☐ pennies
and ☐ nickel
and ☐ dime
for change.

Price: 31¢

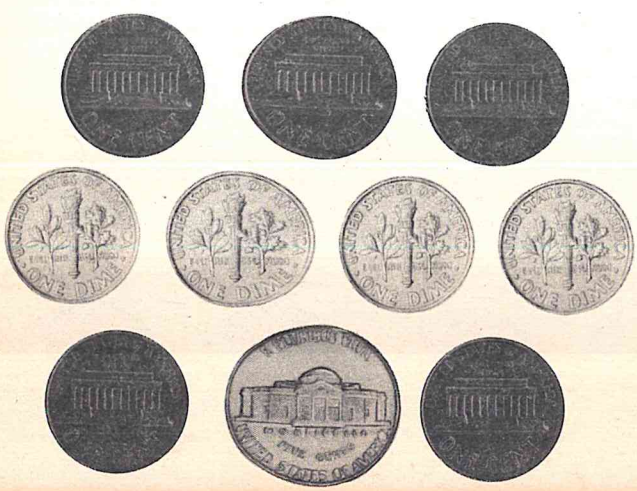
The change is worth ☐ ¢.



Use ☐ pennies
and ☐ dimes
for change.

Price: 52¢

The change is worth ☐ ¢.



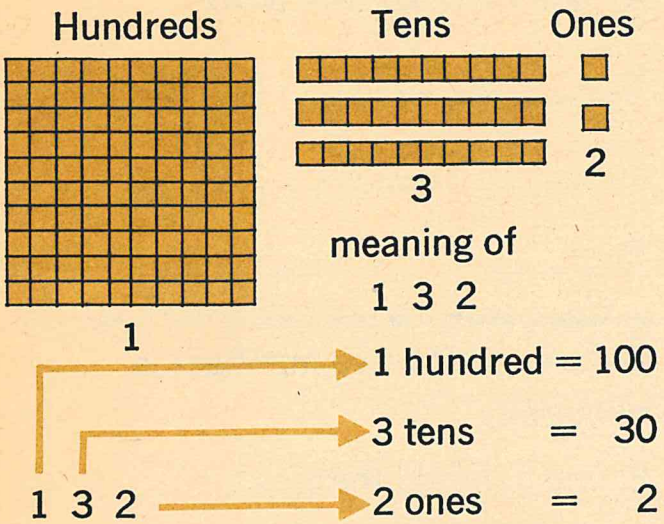
Use ☐ penny
and ☐ nickel
for change.

Price: 69¢

The change is worth ☐ ¢.

In a three-digit numeral, the third digit from the right shows the number of hundreds.

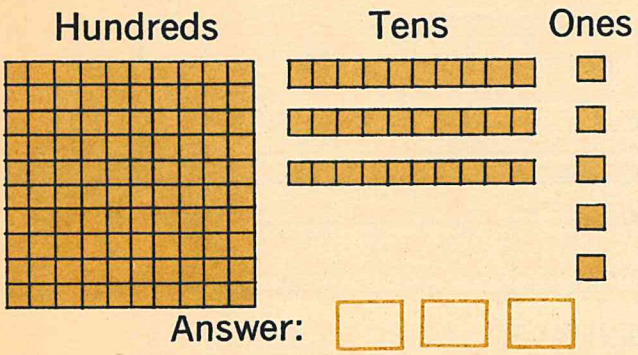
**Example**




In words: one hundred thirty-two

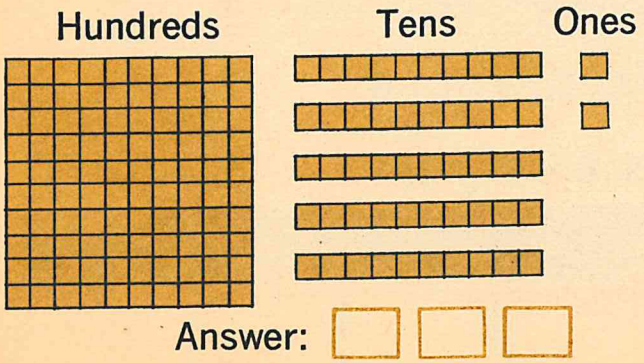
---

Write the numeral shown by each picture.




In words: _____

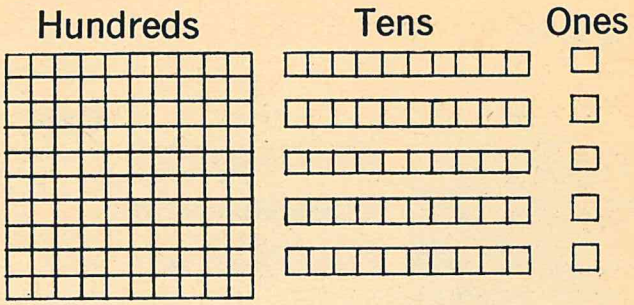
---



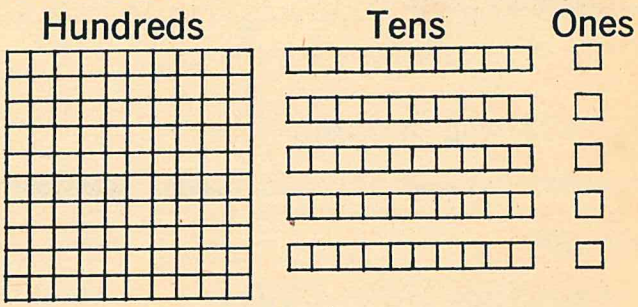

In words: _____

In each exercise color enough hundreds, tens, and ones to show the number.

Show 141.




Show 125.

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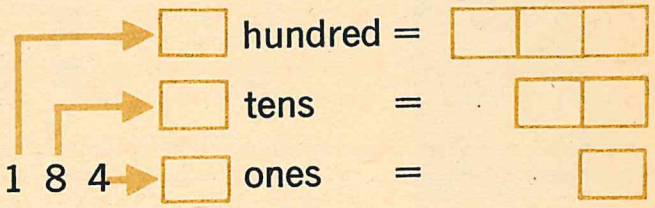
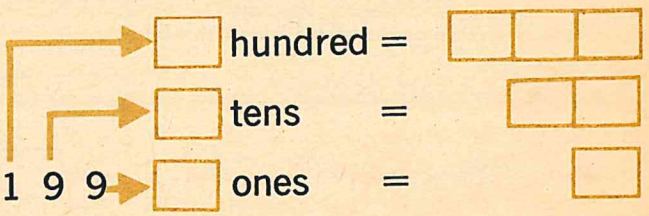


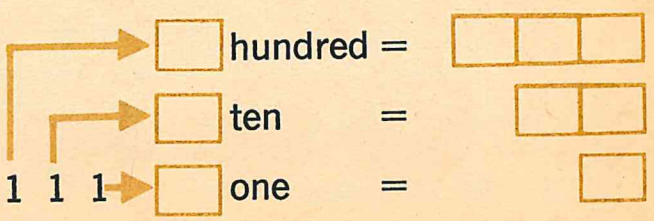

In words: _____

---




In words: _____

---

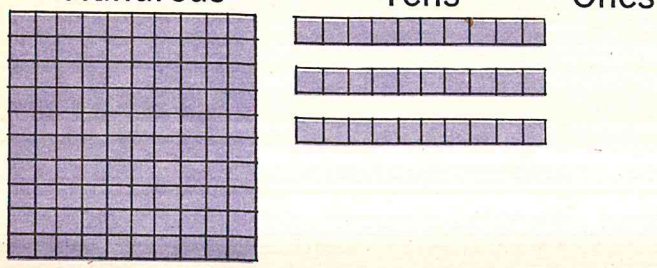



In words: _____

A zero in the ones place means **no ones.**

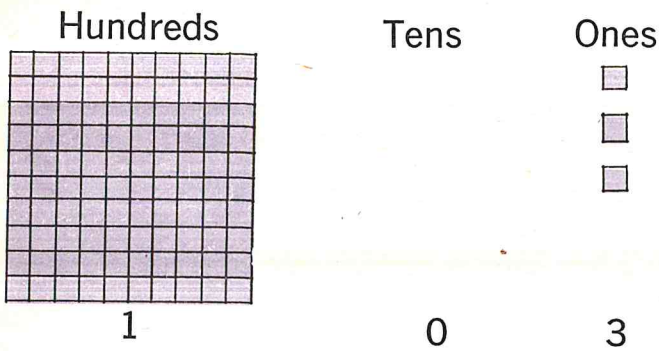
A zero in the tens place means **no tens.**

**Example**

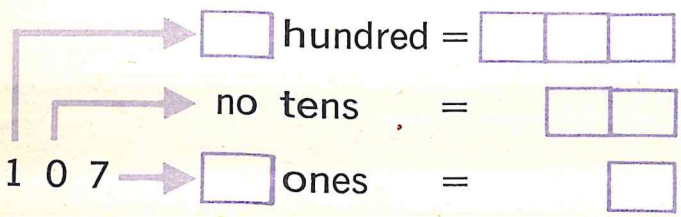



In words: one hundred thirty

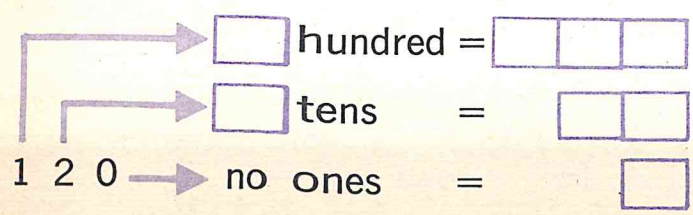
**Example**




In words: one hundred three




In words: _____




In words: _____

Write each of these numbers in words:

A. 126 C. 140

B. 105 D. 112

A. one hundred twenty-six

B. _____

C. _____

D. _____

Write each of these numbers in numerals:

E. one hundred thirteen

F. one hundred fifteen

G. one hundred eighty-seven

H. one hundred nine

E. ☐☐☐ G. ☐☐☐

F. ☐☐☐ H. ☐☐☐

Write in vertical form, that is, with ones under ones, tens under tens, and hundreds under hundreds:

K. 110 + 126 + 184

L. 109 + 145 + 153

M. 180 + 24 + 6

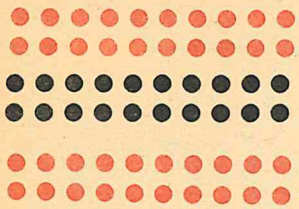
N. 6 + 51 + 191

| K | L | M | N |
|---|---|---|---|
| | | | |

# Times a Number of Tens



3 X 20 means 20 + 20 + 20.



20
20
+ 20
□

3 X 20 = □

20
20
20
+ 20
□

4 X 20 = □

20
20
20
20
+ 20
□

5 X 20 = □

30
+ 30
□

2 X 30 = □

30
30
+ 30
□

3 X 30 = □

20
+ 20
□

2 X 20 = □

20
20
+ 20
□

3 X 20 = □

40
+ 40
□

2 X 40 = □

50
+ 50
□

2 X 50 = □

1 X 30 = □

1 X 40 = □

2 X 20 = 2 X 2 tens
= 2 tens + 2 tens
= 4 tens = 40

3 X 20 = 3 X 2 tens
= 2 tens + 2 tens + 2 tens
= □ tens = □

2 X 30 = 2 X 3 tens
= 3 tens + 3 tens
= □ tens = □

3 X 30 = 3 X 3 tens
= 3 tens + 3 tens + 3 tens
= □ tens = □

2 X 40 = 2 X 4 tens
= □ tens = □

2 X 50 = 2 X 5 tens
= □ tens = □

4 X 20 = 4 X 2 tens
= □ tens = □

5 X 20 = 5 X 2 tens
= □ tens = □

| | |
|---|---|
| 1 X 10 = □ | 1 X 20 = □ |
| 2 X 10 = □ | 1 X 30 = □ |
| 3 X 10 = □ | 1 X 40 = □ |
| 4 X 10 = □ | 1 X 50 = □ |

# Times a Two-Digit Number

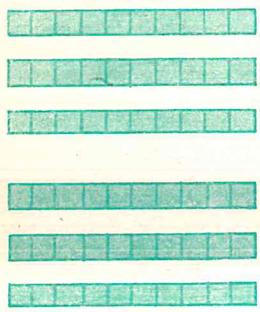
Find 2 X 34.

Estimate: 34 is about 30.

So 2 X 34 is about 2 X 30 = 60.

Exact answer:

Tens Ones



$$\begin{array}{r} 34 \\ +\ 34 \\ \hline 68 \end{array}$$

2 X 34 = 68

---

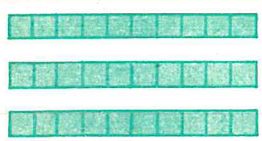
Find 3 X 12.

Estimate: 12 is about 10.

3 X 12 is about 3 X 10 = ☐

Exact answer:

Tens Ones



$$\begin{array}{r} 12 \\ 12 \\ +\ 12 \\ \hline \square \end{array}$$

3 X 12 = ☐

---

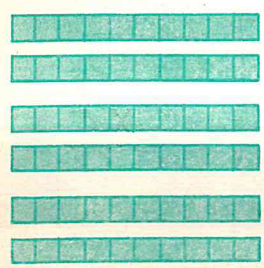
Find 3 X 23.

Estimate: 23 is about 20.

3 X 23 is about 3 X 20 = ☐

Exact answer:

Tens Ones



$$\begin{array}{r} 23 \\ 23 \\ +\ 23 \\ \hline \square \end{array}$$

3 X 23 = ☐

---

Find 3 X 33.

Estimate: about 3 X 30 = ☐

Exact answer:

$$\begin{array}{r} 33 \\ 33 \\ +\ 33 \\ \hline \square \end{array}$$

3 X 33 = ☐

---

Find 2 X 41.

Estimate: about 2 X 40 = ☐

Exact answer:

$$\begin{array}{r} 41 \\ +\ 41 \\ \hline \square \end{array}$$

2 X 41 = ☐

---

Find 2 X 24.

Estimate: about 2 X ☐ = ☐

Exact answer:

$$\begin{array}{r} 24 \\ +\ 24 \\ \hline \square \end{array}$$

2 X 24 = ☐

---

Find 4 X 21.

Estimate: about 4 X ☐ = ☐

Exact answer:

$$\begin{array}{r} 21 \\ 21 \\ 21 \\ +\ 21 \\ \hline \square \end{array}$$

4 X 21 = ☐

---

Find 2 X 43.

Estimate: about ☐

Exact answer:

$$\begin{array}{r} \square \\ +\ \square \\ \hline \square \end{array}$$

2 X 43 = ☐

# Multiplying the Short Way



Find 3 X 32.

Estimate:
about 3 X 30
or 90

**First Way**

32
32
+ 32
96

**Second Way**

3 tens + 2 ones
X 3 X 3
9 tens + 6 ones = 96

**Short Way**

32
X 3
96

For the short way, think: 3 X 2 = 6. 3 X 3 tens = 9 tens.

---

Find 4 X 22.

Estimate:
about 4 X ☐
or ☐

**First Way**

+
☐☐

**Second Way**

☐ tens + ☐ ones
X 4 X 4
☐ tens + ☐ ones = ☐☐

**Short Way**

2 2
X 4
☐☐

---

Find 3 X 11.

Estimate:
about 3 X ☐
or ☐

**First Way**

+
☐☐

**Second Way**

☐ ten + ☐ one
X 3 X 3
☐ tens + ☐ ones = ☐☐

**Short Way**

1 1
X 3
☐☐

---

Find 3 X 13.

Estimate:
about 3 X ☐
or ☐

**First Way**

+
☐☐

**Second Way**

☐ ten + ☐ ones
X 3 X 3
☐ tens + ☐ ones = ☐

**Short Way**

1 3
X 3
☐☐

---

Find 4 X 12¢.

Estimate:
about 4 X ☐ ¢
or ☐ ¢

**First Way**

+
☐☐ ¢

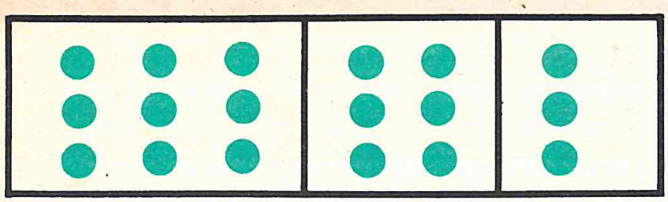
**Second Way**

☐ dime + ☐ pennies
X 4 X 4
☐ dimes + ☐ pennies
= ☐☐ ¢

**Short Way**

1 2¢
X 4
☐☐ ¢

## A Number Divided by Itself



In each box above divide the dots into groups of three by drawing a loop around each group.

There are ☐ 3's in 9. $9 \div 3 =$ ☐

There are ☐ 3's in 6. $6 \div 3 =$ ☐

There is ☐ 3 in 3. $3 \div 3 =$ ☐

How many 2's are there in 2?

Answer: ☐ $2 \div 2 =$ ☐

How many 4's are there in 4?

Answer: ☐ $4 \div 4 =$ ☐

How many 5's are there in 5?

Answer: ☐ $5 \div 5 =$ ☐

How many 1's are there in 1?

Answer: ☐ $1 \div 1 =$ ☐

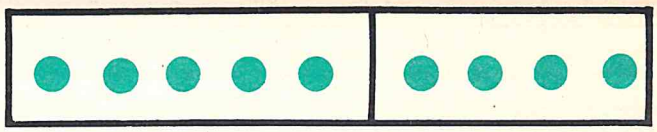
A number divided by itself = ☐

$6 \div 6 =$ ☐ $9 \div 9 =$ ☐

$7 \div 7 =$ ☐ $10 \div 10 =$ ☐

$8 \div 8 =$ ☐ $11 \div 11 =$ ☐

## A Number Divided by One

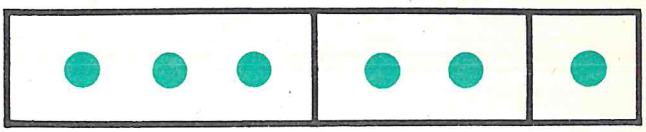


In each box above draw lines to divide the dots into groups of one.

There are ☐ 1's in 5. $5 \div 1 =$ ☐

There are ☐ 1's in 4. $4 \div 1 =$ ☐

Divide each set of dots into groups of one.



There are ☐ 1's in 3. $3 \div 1 =$ ☐

There are ☐ 1's in 2. $2 \div 1 =$ ☐

There are ☐ 1's in 1. $1 \div 1 =$ ☐

A number divided by 1 = itself.

$6 \div 1 =$ ☐ $10 \div 1 =$ ☐

$7 \div 1 =$ ☐ $11 \div 1 =$ ☐

$8 \div 1 =$ ☐ $12 \div 1 =$ ☐

$9 \div 1 =$ ☐ $13 \div 1 =$ ☐

Add.

$$\begin{array}{r} 46 \\ +\ 15 \\ \hline \square \end{array}$$

Subtract.

$$\begin{array}{r} 42 \\ -\ 18 \\ \hline \square \end{array}$$

Find 3 X 31.

Estimate:

about 3 X ☐

or ☐

**First Way**

$$\begin{array}{r} \\ + \\ \hline \square\square \end{array}$$

**Second Way**

☐ tens + ☐ one

X 3 X 3

☐ tens + ☐ ones

= ☐☐

**Short Way**

$$\begin{array}{r} 3\ 1 \\ \times\ 3 \\ \hline \square\square \end{array}$$

# A Remainder of One

$2\overline{)6}$ is a short way of asking:

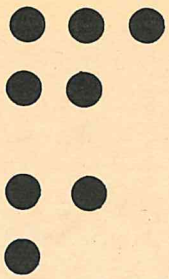
How many twos are there in 6?
Write the answer here → $\square$

$2\overline{)6}$

$3\overline{)\square}$ $6$ $\quad 2\overline{)\square}$ $10$ $\quad 3\overline{)\square}$ $9$

$4\overline{)\square}$ $8$ $\quad 5\overline{)\square}$ $5$ $\quad 1\overline{)\square}$ $3$

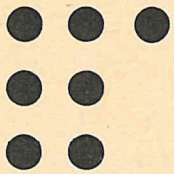
Divide into groups of two.



$2\overline{)\square}$ $5$ and $\square$ left

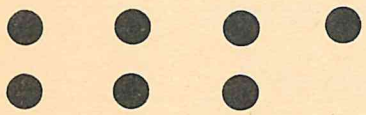
$2\overline{)\square}$ $3$ and $\square$ left

Divide into groups of three.



$3\overline{)\square}$ $7$ and $\square$ left

$2\overline{)7}$ asks: How many twos are there in 7?



Using 7 dots you can form 3 groups of 2, and there is 1 dot left.
So this is the answer:

3 and 1 left
$2\overline{)7}$

Here are two more ways of saying the answer:

3 and 1 over
3 and remainder of 1

$2\overline{)15}$ Think: There are $\square$ twos in 14. $14 + \square = 15$

$2\overline{)\square}$ $15$ and $\square$ left

$2\overline{)\square}$ $19$ and $\square$ left

$3\overline{)\square}$ $19$ and $\square$ left

$3\overline{)\square}$ $13$ and $\square$ left

$4\overline{)\square}$ $13$ and $\square$ left

Find 2 X 23¢.

Estimate:
about 2 X $\square$ ¢
or $\square$ ¢

**First Way**

$+$ ____
$\square$ ¢

**Second Way**

$\square$ dimes + $\square$ pennies
X 2 X 2

$\square$ dimes + $\square$ pennies
= $\square\square$ ¢

**Short Way**

2 3¢
X 2
$\square\square$ ¢

# Numbers up to One Thousand

Write these numbers in numerals:

one hundred ☐☐☐

two hundred ☐☐☐

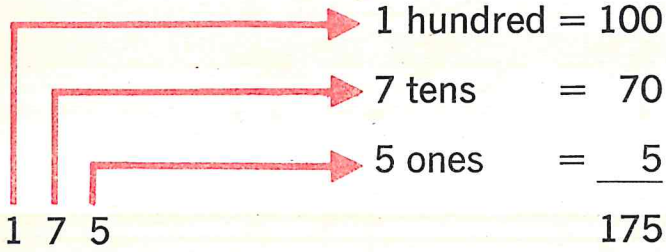
three hundred ☐☐☐

four hundred ☐☐☐

five hundred ☐☐☐

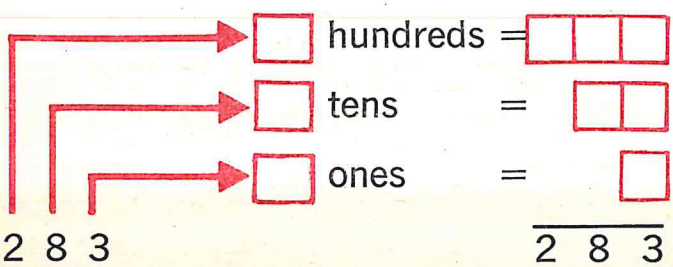
175 means 1 hundred + 7 tens + 5 ones.

175 = 100 + 70 + 5



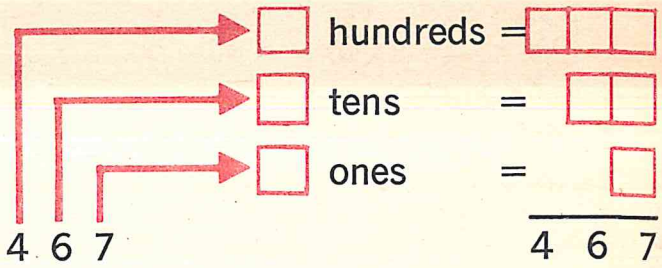

To read 175 say:

One hundred seventy-five.



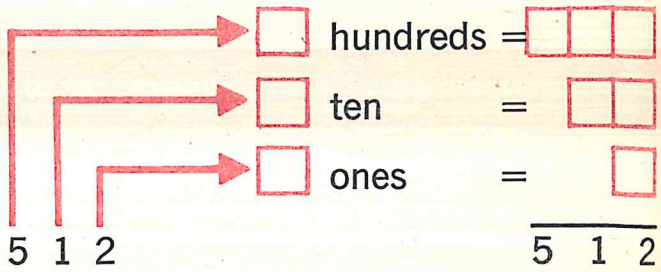

To read 283 say: _____

_____




To read 467 say: _____

_____




To read 512 say:

Five hundred twelve.

To read 715 say: _____

_____

The next number after 99 is 100.

The next number after 199 is 200.

The next number after 299 is ☐☐☐

The next number after 699 is ☐☐☐

The next number after 899 is ☐☐☐

The next number after 999 is called **one thousand.**

We write it like this: 1,000

Find 3 X 33.

Estimate:
about 3 X ☐
or ☐

**First Way**

+ ☐

**Second Way**

☐ tens + ☐ ones
X 3 X 3

☐ tens + ☐ ones
= ☐☐

**Short Way**

3 3
X 3
☐☐

Count by ones.

167 ☐ ☐

☐ ☐ ☐

Count by ones.

295 ☐ ☐

☐ ☐ ☐

Count by ones.

395 ☐ ☐

☐ ☐ ☐

Count by twos.

490 ☐ ☐

☐ ☐ ☐

Count by twos.

690 ☐ ☐

☐ ☐ ☐

Count by twos.

890 ☐ ☐

☐ ☐ ☐

Write each of these numbers in numerals:

A. two hundred nineteen

B. three hundred eighty-six

C. four hundred seventy-five

D. nine hundred ninety

E. five hundred forty

F. three hundred five

G. six hundred eight

H. seven hundred twenty

A. ☐☐☐ E. ☐☐☐

B. ☐☐☐ F. ☐☐☐

C. ☐☐☐ G. ☐☐☐

D. ☐☐☐ H. ☐☐☐

Write in vertical form:

I. 26 + 543 + 221

J. 612 + 75 + 439

K. 125 + 47 + 8

| I | J | K |
|---|---|---|
| | | |

Find 4 X 21.

Estimate:

About 4 X ☐

or ☐

**First Way**

+ ___

☐☐

**Second Way**

☐ tens + ☐ one

X 4 X 4

☐ tens + ☐ ones

= ☐

**Short Way**

21

X 4

☐☐

# The Nearest Hundred

Count by 50's to 800.

| | | | |
|---|---|---|---|
| 50 | 100 | 150 | |
| | | | |
| | | | |
| | | | 800 |

Underline the right word.

49 is (fewer, more) than 50.

61 is (fewer, more) than 50.

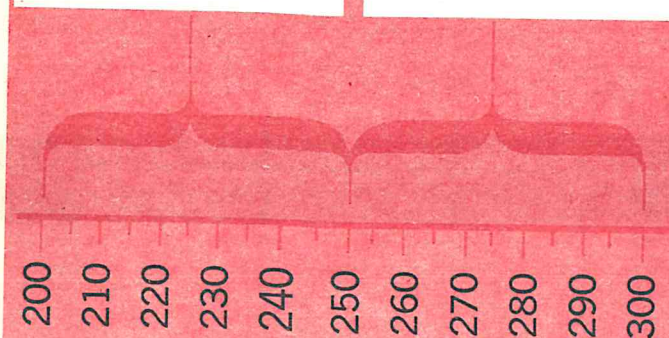
137 is (fewer, more) than 150.

272 is (fewer, more) than 250.

348 is (fewer, more) than 350.

Numbers between 200 and 250 are nearer to 200 than to 300.

Numbers between 250 and 300 are nearer to 300 than to 200.




The hundred that is nearest 260 is 300.

The hundred that is nearest 225 is 200.

The hundred that is nearest 364 is ____.

The hundred that is nearest 412 is ____.

Round off to the nearest hundred:

75 is about 100.

284 is about ____.

821 is about ____.

## Regrouping

1 ten = ____ ones

1 hundred = ____ tens

2 hundreds + 5 tens + 3 ones

= 2 hundreds + 4 tens + ____ ones

3 hundreds + 7 tens + 2 ones

= 3 hundreds + ____ tens + 12 ones

5 hundreds + 2 tens + 7 ones

= 4 hundreds + ____ tens + 7 ones

6 hundreds + 0 tens + 5 ones

= ____ hundreds + 10 tens + 5 ones

Find 3 X 23.

Estimate:

About 3 X ____

or ____

**First Way**

\+

____

**Second Way**

____ tens + ____ ones

X 3 X 3

____ tens + ____ ones

= ____

**Short Way**

2 3

X 3

____ ____

# Money up to Five Dollars



1 dollar is worth 100¢.

2 dollars are worth ☐ ¢.

3 dollars are worth ☐ ¢.

4 dollars are worth ☐ ¢.

5 dollars are worth ☐ ¢.

☐ tens = 100

1 dollar = ☐ dimes

2 dollars = ☐ dimes

3 dollars = ☐ dimes

4 dollars = ☐ dimes

5 dollars = ☐ dimes

50 + 50 = ☐

25 + 25 + 25 + 25 = ☐

1 dollar = ☐ half dollars

1 dollar = ☐ quarters

1 nickel = ☐ cents

10 nickels = ☐ cents

20 nickels = ☐ cents

1 dollar = ☐ nickels

2 dollars = ☐ nickels

1 dollar and 12 cents is nearer to $1 than to $2.

1 dollar and 64 cents is nearer to $2 than to $1.

Round off to the nearest dollar:

2 dollars and 24 cents is about $ ☐

3 dollars and 75 cents is about $ ☐

4 dollars and 81 cents is about $ ☐

2 dollars and 48 cents is about $ ☐

4 dollars and 51 cents is about $ ☐

3 dollars and 69 cents is about $ ☐

2 dollars and 19 cents is about $ ☐

The numbers in each chain go up or down in equal steps.

Write the missing numbers.

196 — 198 — ☐ — ☐ — 204

205 — 203 — ☐ — ☐ — 197

495 — 498 — ☐ — ☐ — 507

390 — 395 — ☐ — ☐ — 410

720 — 710 — ☐ — ☐ — 680

802 — 801 — ☐ — ☐ — 798

Find 4 X 11.

Estimate:

About 4 X ☐

or ☐

**First Way**

+

☐☐

**Second Way**

☐ ten + ☐ one

X 4

☐ tens + ☐ ones

= ☐

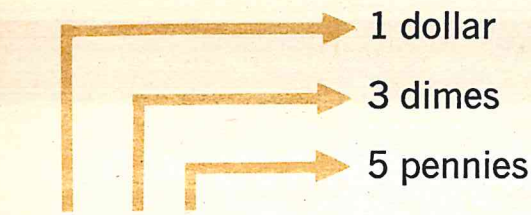
**Short Way**

1 1

X 4

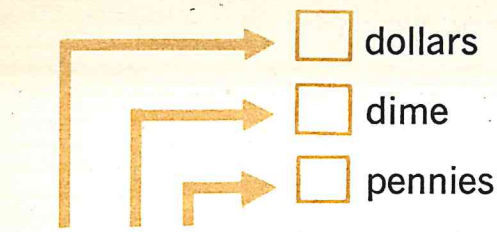
☐☐

# Dollars and Cents



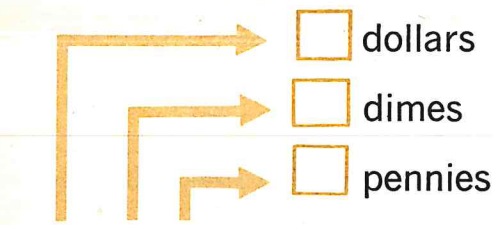

Say:

1 dollar and 35 cents.



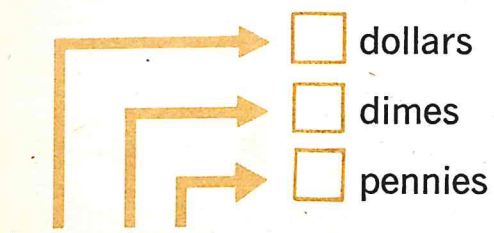

Say:

dollars and cents.




Say:

dollars and cents.




Say:

dollars.

23 cents = dimes and pennies

57 cents = dimes and pennies

18 cents = dime and pennies

9 cents = dimes and pennies

5 cents = dimes and pennies

no cents = dimes and pennies

**$** means dollars.
The **decimal point** separates the dollars from the cents.

The first number after the point is the number of dimes.
The second number after the point is the number of pennies.

Use the dollar sign and decimal point to write these sums of money:

**Example**

5 dollars and 29 cents $5.29
(5 dollars, 2 dimes, 9 pennies)
4 dollars and 2 cents $4.02
(4 dollars, 0 dimes, 2 pennies)

2 dollars and 16 cents $.

3 dollars and 25 cents $.

1 dollar and 9 cents $.

4 dollars and 56 cents $.

2 dollars and 5 cents $.

6 dollars $.

# Adding or Subtracting Ones, Tens, or Hundreds



$65 + 2 = 67$

$165 + 2 = 100 + 65 + 2$

$= 100 + 67 = 167$

$265 + 2 = 200 + 65 + 2$

$= 200 +$ ☐ $=$ ☐

$365 + 2 =$ ☐ $\quad 124 + 4 =$ ☐

$415 + 3 =$ ☐ $\quad 581 + 5 =$ ☐

$206 + 1 =$ ☐ $\quad 622 + 6 =$ ☐

$89 - 4 =$ ☐

$189 - 4 = 100 + 89 - 4$

$= 100 +$ ☐ $=$ ☐

$289 - 4 = 200 + 89 - 4$

$= 200 +$ ☐ $=$ ☐

$389 - 4 =$ ☐ $\quad 516 - 2 =$ ☐

$475 - 1 =$ ☐ $\quad 729 - 1 =$ ☐

$627 - 3 =$ ☐ $\quad 559 - 8 =$ ☐

$6 + 8 =$ ☐ $\quad 56 + 8 =$ ☐

$7 + 9 =$ ☐ $\quad 27 + 9 =$ ☐

$8 + 8 =$ ☐ $\quad 38 + 8 =$ ☐

$138 + 8 = 100 + 38 + 8$

$= 100 +$ ☐ $=$ ☐

$238 + 8 = 200 + 38 + 8$

$= 200 +$ ☐ $=$ ☐

$338 + 8 =$ ☐ $\quad 527 + 6 =$ ☐

$425 + 7 =$ ☐ $\quad 839 + 2 =$ ☐

$619 + 5 =$ ☐ $\quad 758 + 5 =$ ☐

$14 - 8 =$ ☐ $\quad 24 - 8 =$ ☐

$12 - 8 =$ ☐ $\quad 42 - 9 =$ ☐

$13 - 7 =$ ☐ $\quad 53 - 7 =$ ☐

$153 - 7 = 100 + 53 - 7$

$= 100 +$ ☐ $=$ ☐

$253 - 7 = 200 + 53 - 7$

$= 200 +$ ☐ $=$ ☐

$353 - 7 =$ ☐ $\quad 472 - 5 =$ ☐

$642 - 9 =$ ☐ $\quad 871 - 6 =$ ☐

$513 - 4 =$ ☐ $\quad 344 - 7 =$ ☐

$247 = 200 + 40 + 7$

$247 + 20 = 267$ because

$40 + 20 = 60$

$417 + 30 =$ ☐ $\quad 875 - 10 =$ ☐

$625 + 40 =$ ☐ $\quad 652 - 20 =$ ☐

$315 + 80 =$ ☐ $\quad 973 - 30 =$ ☐

$805 + 20 =$ ☐ $\quad 745 - 40 =$ ☐

$365 = 300 + 65$

$365 + 200 = 565$ because

$300 + 200 = 500$

$415 + 100 =$ ☐ $\quad 611 - 100 =$ ☐

$591 + 200 =$ ☐ $\quad 826 - 400 =$ ☐

$312 + 400 =$ ☐ $\quad 714 - 500 =$ ☐

$271 + 300 =$ ☐ $\quad 943 - 600 =$ ☐

$118 + 500 =$ ☐ $\quad 901 - 800 =$ ☐

# Column Addition

Write in vertical form and add: $21 + 13 + 5 + 12$.

21 = 2 tens + 1 one
13 = 1 ten + 3 ones
5 = 5 ones
12 = 1 ten + 2 ones

4 tens + 11 ones
= 5 tens + 1 one = 51

| Tens | Ones | |
|---|---|---|
| 1 | | |
| 2 | 1 | First add the ones. |
| 1 | 3 | Think: 1, 4, 9, 11. |
| | 5 | 11 ones = 1 one and 10 ones |
| +1 | 2 | = 1 one and 1 ten. |
| | | After the exchange, add the tens. |

Short Way:

Write in vertical form and add: $36 + 4 + 13 + 21$.

36 = ☐ tens + ☐ ones
4 = ☐ ones
13 = ☐ ten + ☐ ones
21 = ☐ tens + ☐ one

☐ tens + ☐ ones
= ☐ tens + ☐ ones = ☐

| Tens | Ones |
|---|---|
| | |
| 3 | 6 |
| | 4 |
| 1 | 3 |
| +2 | 1 |
| | |

Short Way:

First add the ones.

Exchange ten ones for one ten.

Then add the tens.

Write in vertical form and add from the top down.
Check by adding from the bottom up.

26 + 47 + 9

16 + 3 + 18 + 2

15 + 25 + 13 + 9

8 + 24 + 15 + 28

23 + 22 + 8 + 36

11 + 12 + 13 + 14

21 + 10 + 9 + 8

5 + 20 + 16 + 18

# Adding Three-Digit Numbers



Add 325 + 412.

Estimate:

325 is about 300.

412 is about 400.

The sum is about 700.

Exact answer:

325 = 3 hundreds + 2 tens + 5 ones

412 = 4 hundreds + 1 ten + 2 ones

325 + 412 = 7 hundreds + 3 tens + 7 ones = ☐

Add 132 + 253.

Estimate:

132 is about ☐

253 is about ☐

The sum is about ☐

Exact answer:

132 = ☐ hundred + ☐ tens + ☐ ones

253 = ☐ hundreds + ☐ tens + ☐ ones

132 + 253 = ☐ hundreds + ☐ tens + ☐ ones = ☐

Add each column separately.

| Hundreds | Tens | Ones |
|---|---|---|
| 4 | 1 | 2 |
| + 2 | 1 | 5 |
| ☐ | ☐ | ☐ |

412 + 215 = ☐

| Hundreds | Tens | Ones |
|---|---|---|
| 4 | 2 | 3 |
| + 3 | 1 | 4 |
| ☐ | ☐ | ☐ |

423 + 314 = ☐

| Hundreds | Tens | Ones |
|---|---|---|
| 6 | 0 | 5 |
| + 1 | 4 | 4 |
| ☐ | ☐ | ☐ |

605 + 144 = ☐

Add.

| | | |
|---|---|---|
| 214 + 323 = ☐ | 621 + 125 = ☐ | 344 + 145 = ☐ |
| 407 + 201 = ☐ | 234 + 133 = ☐ | 816 + 121 = ☐ |
| $3.23 + 4.15 = $☐.☐ | $4.16 + 2.51 = $☐.☐ | |
| $1.45 + 2.12 = $☐.☐ | $5.21 + 2.43 = $☐.☐ | |
| $6.41 + 1.24 = ☐ | $4.44 + 2.15 = ☐ | |

# Subtracting Three-Digit Numbers

Subtract 864 – 123.

Estimate:

864 is about 900.

123 is about 100.

Difference: 800

Exact answer:

864 = 8 hundreds and 6 tens and 4 ones

123 = 1 hundred and 2 tens and 3 ones

864 – 123 = 7 hundreds and 4 tens and 1 one = 741

Subtract 457 – 214.

Estimate:

457 is about ☐

214 is about ☐

Difference: ☐

Exact answer:

457 = ☐ hundreds and ☐ tens and ☐ ones

214 = ☐ hundreds and ☐ ten and ☐ ones

457 – 214 = ☐ hundreds and ☐ tens and ☐ ones = ☐

Subtract in each column separately.

| Hundreds | Tens | Ones |
|---|---|---|
| 7 | 8 | 9 |
| – 2 | 1 | 5 |
| ☐ | ☐ | ☐ |

789 – 215 = ☐

| Hundreds | Tens | Ones |
|---|---|---|
| 6 | 5 | 4 |
| – 3 | 5 | 2 |
| ☐ | ☐ | ☐ |

654 – 352 = ☐

| Hundreds | Tens | Ones |
|---|---|---|
| 6 | 4 | 3 |
| – 3 | 3 | 1 |
| ☐ | ☐ | ☐ |

643 – 331 = ☐

Subtract.

| | | |
|---|---|---|
| 338 – 114 = ☐ | 267 – 135 = ☐ | 381 – 271 = ☐ |
| 563 – 461 = ☐ | 352 – 21 = ☐ | 819 – 706 = ☐ |
| \$2.15 – 1.05 = \$☐.☐ | \$4.75 – 2.20 = \$☐.☐ | |
| \$6.19 – 1.18 = \$☐.☐ | \$4.83 – 2.11 = \$☐.☐ | |
| \$3.79 – .23 = ☐ | \$5.86 – 1.42 = ☐ | |

# Times a Number of Hundreds



3 X 200 means

200 + 200 + 200

= 2 hundreds + 2 hundreds

+ 2 hundreds = 6 hundreds

3 X 200 = ☐

2 X 200 = 200 + 200

2 X 200 = ☐

300

+ 300

☐

2 X 300 = ☐

400

+ 400

☐

2 X 400 = ☐

3 X 300 = 3 X 3 hundreds

= ☐ hundreds = ☐

4 X 200 = 4 X 2 hundreds

= ☐ hundreds = ☐

1 X 200 = ☐ 1 X 500 = ☐

1 X 300 = ☐ 1 X 600 = ☐

1 X 400 = ☐ 1 X 700 = ☐

2 X 100 = ☐ 5 X 100 = ☐

3 X 100 = ☐ 6 X 100 = ☐

4 X 100 = ☐ 7 X 100 = ☐

100¢ = 1 dollar = $1.00

200¢ = 2 dollars = $2.00

300¢ = ☐ dollars = ☐

400¢ = ☐ dollars = ☐

500¢ = ☐ dollars = ☐

700¢ = ☐ dollars = ☐

900¢ = ☐ dollars = ☐

625¢ = 600¢ + 25¢

= 6 dollars and 25 cents

= $6.25

437¢ = ☐¢ + 37¢

= ☐ dollars and 37 cents

= $ ☐.☐☐

851¢ = ☐¢ + 51¢

= ☐ dollars and 51 cents

= $ ☐.☐☐

542¢ = ☐¢ + 42¢

= ☐ dollars and 42 cents

= $ ☐.☐☐

75¢ = 0 dollars and 75 cents

= $0.75.

You usually leave out the zero for no dollars: $.75

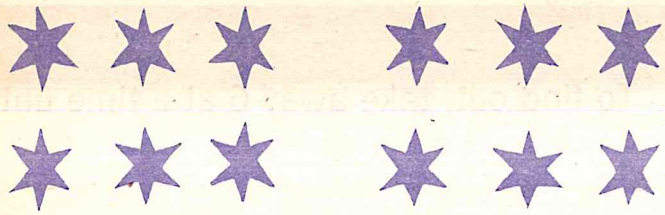
85¢ = $.85 64¢ = $.☐☐

39¢ = ☐ 25¢ = ☐

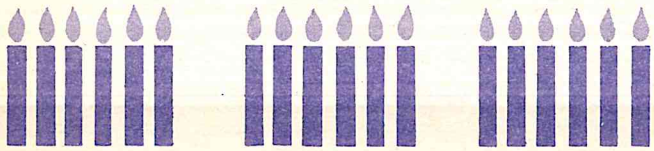
$.86 means ☐ dollars and ☐ cents.

$.92 means ☐ dollars and ☐ cents.

# Sixes



$2 \times 6 = 6 + 6 = 12$



$3 \times 6 = 6 + 6 + 6 = 18$

$4 \times 6 =$ double $2 \times 6$

$= 2 \times 12$

$$\begin{array}{r} 12 \\ \times\ 2 \\ \hline \square\square \end{array}$$

$4 \times 6 = \square$

$5 \times 6 = 2 \times 6 + 3 \times 6$

$= \square + \square$

$= \square$

$6 \times 6 =$ double $3 \times 6$

$= 2 \times 18$

$$\begin{array}{r} 18 \\ +\ 18 \\ \hline \square \end{array}$$

$6 \times 6 = \square$

$1 \times 6 = \square$ $\quad 2 \times 6 = \square$

$3 \times 6 = \square$ $\quad 4 \times 6 = \square$

$5 \times 6 = \square$ $\quad 6 \times 6 = \square$

$7 \times 6 = 6 \times 6 + 6$

$= \square + 6 = \square$

$8 \times 6 = 7 \times 6 + 6$

$= \square + 6 = \square$

$9 \times 6 = 8 \times 6 + 6$

$= \square + 6 = \square$

$10 \times 6 = 9 \times 6 + 6$

$= \square + 6 = \square$

Count by sixes.

| | | | | |
|---|---|---|---|---|
| 6 | 12 | | | |
| | | | | |

| | | | |
|---|---|---|---|
| 30 | 48 | 36 | 54 |
| $+\ 6$ | $+\ 6$ | $+\ 6$ | $+\ 6$ |
| $\square$ | $\square$ | $\square$ | $\square$ |

$\square \times 6 = 12$ $\quad \square \times 6 = 54$

$\square \times 6 = 18$ $\quad \square \times 6 = 48$

$\square \times 6 = 24$ $\quad \square \times 6 = 42$

$\square \times 6 = 30$ $\quad \square \times 6 = 36$

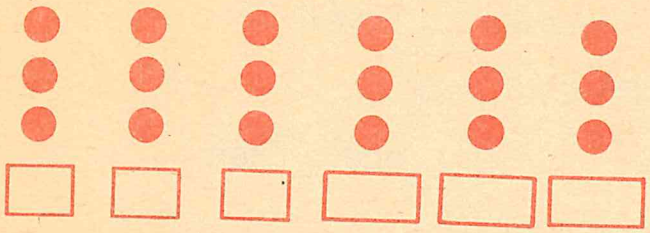
| | | | |
|---|---|---|---|
| 12 | 24 | 30 | 42 |
| $\times\ 2$ | $\times\ 2$ | $\times\ 2$ | $\times\ 2$ |
| $\square$ | $\square$ | $\square$ | $\square$ |

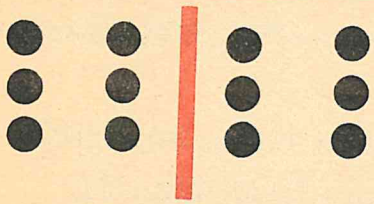
Count backwards by sixes.

| | | | | |
|---|---|---|---|---|
| 30 | | | | |

# Dividing by Six

Count these dots by threes.
Write the numbers in the boxes as you count.





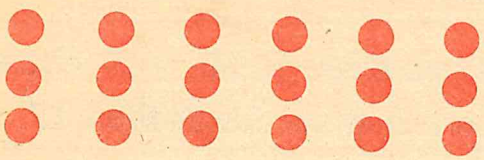
The colored line divides the 12 dots into groups of 6.

There are ☐ sixes in 12.

$12 \div 6 = \square$

$6 \overline{)\square 12}$

Divide these dots into groups of 6.

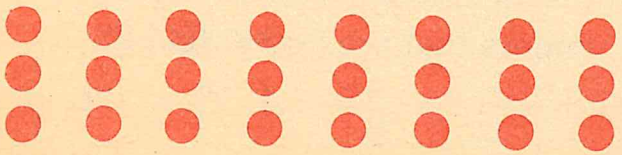


There are ☐ sixes in 18.

$18 \div 6 = \square$

$6 \overline{)\square 18}$

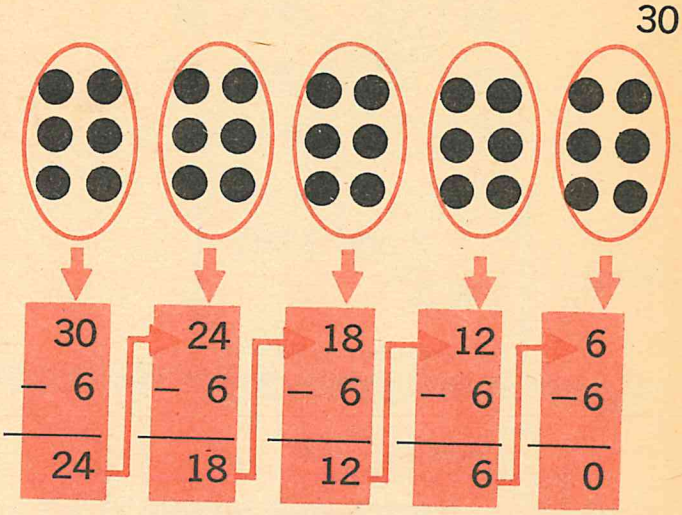
Divide these dots into groups of 6.



$24 \div 6 = \square$

$6 \overline{)\square 24}$

How many sixes are there in 30?
To find out, take away 6 at a time until none are left.



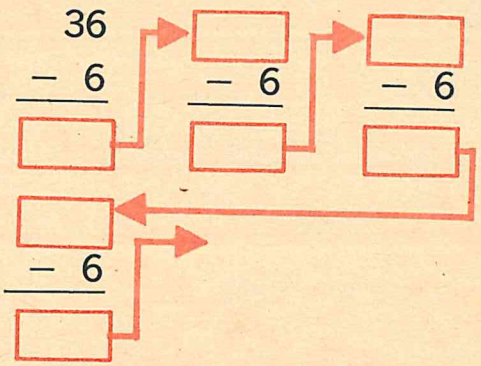

Count the sixes we took away.

There are ☐ sixes in 30.

$30 \div 6 = \square$

$6 \overline{)\square 30}$

How many sixes are there in 36?




Continue taking away sixes until you have 0 left.

There are ☐ sixes in 36.

$36 \div 6 = \square$

$6 \overline{)\square 36}$

$7 \times 6 = \square$ $\qquad$ $\square \div 6 = 7$

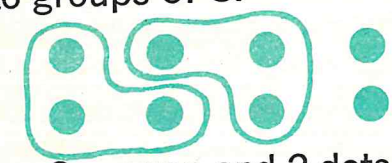
$8 \times 6 = \square$ $\qquad$ $\square \div 6 = 8$

$9 \times 6 = \square$ $\qquad$ $\square \div 6 = 9$

$10 \times 6 = \square$ $\qquad$ $\square \div 6 = 10$

# Remainder of One, Two, or Three

$3\overline{)8}$ means: How many threes are there in 8? To answer the question, divide 8 dots into groups of 3.



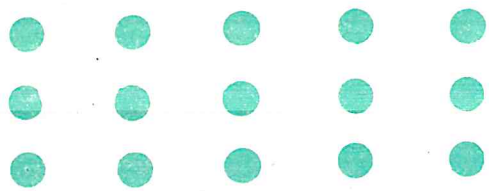
There are 2 groups and 2 dots left.

Write: 2 and 2 left
$3\overline{)8}$

---

☐ and ☐ left

$4\overline{)15}$ (Divide into groups of 4.)



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$5\overline{)23}$ Count by fives to a number that is almost 23:

5, 10, 15, 20.

Think: There are ☐ fives in 20.

20 + ☐ = 23

☐ and ☐ left

$5\overline{)23}$

---

$6\overline{)32}$ Count by sixes:

6, 12, 18, 24, 30.

There are ☐ sixes in 30.

30 + ☐ = 32

☐ and ☐ left

$6\overline{)32}$

---

$5\overline{)27}$ Count by fives, and circle the numbers that are fewer than 27.

(5), (10), (15), (20), (25), 30, 35

There are ☐ fives in 25.

25 + ☐ = 27

☐ and ☐ left

$5\overline{)27}$

---

$4\overline{)31}$ Count by fours, and circle the numbers that are fewer than 31.

(4), (8), (12), (16), (20), (24), (28), 32

There are ☐ fours in 28.

28 + ☐ = 31

☐ and ☐ left

$4\overline{)31}$

---

Count by fives to 30, and circle the numbers that are fewer than 17.

☐ ☐ ☐ ☐ ☐ ☐

☐ and ☐ left

$5\overline{)17}$

---

Count by sixes to 36, and circle the numbers that are fewer than 25.

☐ ☐ ☐ ☐ ☐ ☐

☐ and ☐ left

$6\overline{)25}$

Count by fives to 30, and circle the numbers that are less than 21.

□ and □ left

5 ⟌ 21

Count by fours to 24, and circle the numbers that are less than 18.

□ and □ left

4 ⟌ 18

Count by threes to 18, and circle the numbers that are less than 11.

□ and □ left

3 ⟌ 11

□ and □ left

4 ⟌ 13

□ and □ left

6 ⟌ 14

□ and □ left

5 ⟌ 12

□ and □ left

4 ⟌ 7

□ and □ left

3 ⟌ 14

7 X 5 = □ 8 X 5 = □

□ and □ left

5 ⟌ 37

6 X 6 = □ 7 X 6 = □

□ and □ left

6 ⟌ 39

8 X 4 = □ 9 X 4 = □

□ and □ left

4 ⟌ 35

□ and □ left

4 ⟌ 30

□ and □ left

3 ⟌ 26

□ and □ left

6 ⟌ 55

□ and □ left

4 ⟌ 33

There are no groups of four in three.

0 and 3 left

4 ⟌ 3

□ and □ left

6 ⟌ 2

□ and □ left

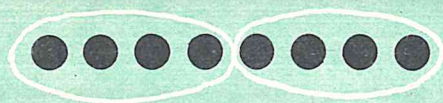
5 ⟌ 1

□ and □ left

4 ⟌ 2

# Dividing into Two, Three, or Four Equal Parts

John had 8 jelly beans to share with his sister. He divided them into 2 equal groups.



There were 4 jelly beans in each group.
Each group is one half of 8.
one half of 8 = 4

8 ÷ 2 = ☐ 2⟌8

Divide into 3 equal groups:

one third of 9 = ☐

9 ÷ 3 = ☐ 3⟌9

Divide into 4 equal groups:

one fourth of 8 = ☐

8 ÷ 4 = ☐ 4⟌8

Divide into 2 equal groups:

one half of 6 = ☐

6 ÷ 2 = ☐ 2⟌6

one half of 4 = ☐

4 ÷ 2 = ☐ 2⟌4

Divide into 3 equal groups:

one third of 6 = ☐

6 ÷ 3 = ☐ 3⟌6

Divide 12 pennies into 3 equal groups.

one third of 12 = ☐

12 ÷ 3 = ☐ 3⟌12

Divide 15 pennies into 3 equal groups.

one third of 15 = ☐

15 ÷ 3 = ☐ 3⟌15

Divide 12 pennies into 4 equal groups.

one fourth of 12 = ☐

12 ÷ 4 = ☐ 4⟌12

A 12-inch ribbon was cut into 2 equal parts.

one half of 12 inches = ☐ inches

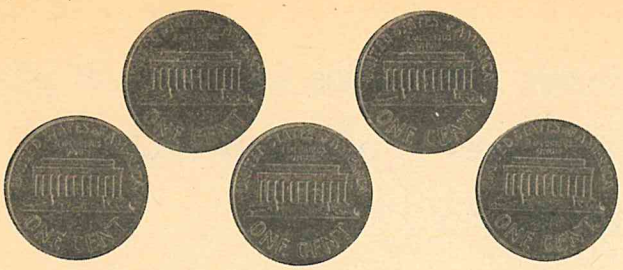
12 ÷ 2 = ☐ 2⟌12

Each piece of ribbon was ☐ inches.

Ten pounds of grass seed were divided into two equal parts. There were ☐ pounds in each part.

# Dividing into Five Equal Parts





To do these exercises, first get 20 pennies. Put one penny on each of the pictures above. Then put a second penny on top of the first one in each place. In this way you divide 10 pennies into 5 equal piles.

Each pile has ☐ pennies.

one fifth of 10 = ☐

$10 \div 5 =$ ☐

$5\overline{)10}$ ☐

On the pictures above, divide 15 pennies into 5 equal piles.

Each pile has ☐ pennies.

one fifth of 15 = ☐

$15 \div 5 =$ ☐

$5\overline{)15}$ ☐

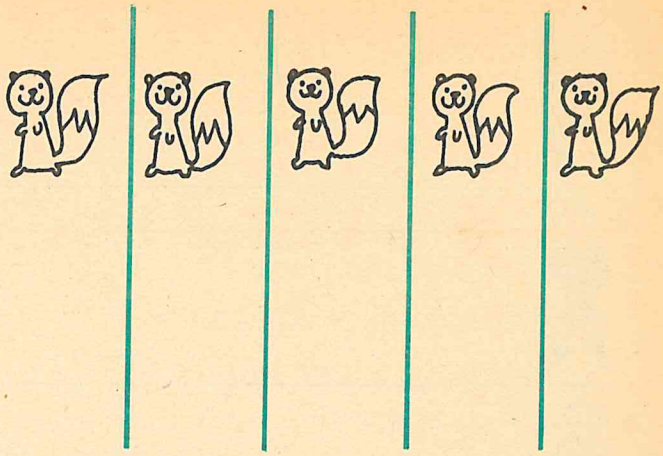
On the pictures above, divide 20 pennies into 5 equal piles.

Each pile has ☐ pennies.

one fifth of 20 = ☐

$20 \div 5 =$ ☐

$5\overline{)20}$ ☐



There are 25 nuts to be shared equally by these 5 squirrels. Help them by drawing dots to stand for the nuts. Draw one dot under each squirrel. Then draw another dot under each squirrel. Continue in this way until you have drawn 25 dots.

Each squirrel has ☐ nuts.

one fifth of 25 = ☐

$25 \div 5 =$ ☐

$5\overline{)25}$ ☐

Divide 30 pennies into 5 equal piles.

one fifth of 30 = ☐

$30 \div 5 =$ ☐

$5\overline{)30}$ ☐

Divide 35 buttons into 5 equal piles.

one fifth of 35 = ☐

$35 \div 5 =$ ☐

$5\overline{)35}$ ☐

# Dividing into Six Equal Parts

These six boys are sharing 18 marbles equally. Help them by handing out the marbles. Draw one marble in each space. Then draw another marble in each space. Continue in this way until you have drawn 18 marbles.

Each boy has ☐ marbles.

one sixth of 18 = ☐

18 ÷ 6 = ☐ $6\overline{)18}$ (☐ over)

Now draw another marble for each boy.

18 + 6 = 24

24 ÷ 6 = ☐ $6\overline{)24}$ (☐ over)

Divide 12 pennies into 6 equal piles.

There are ☐ pennies in each pile.

one sixth of 12 = ☐

12 ÷ 6 = ☐ $6\overline{)12}$ (☐ over)

Divide 6 pennies into 6 equal piles.

There is ☐ penny in each pile.

one sixth of 6 = ☐

6 ÷ 6 = ☐ $6\overline{)6}$ (☐ over)

Divide 5 pennies into 5 equal piles.

There is ☐ penny in each pile.

one fifth of 5 = ☐

5 ÷ 5 = ☐ $5\overline{)5}$ (☐ over)

one fourth of 4 = ☐

4 ÷ 4 = ☐ $4\overline{)4}$ (☐ over)

one half of 10 = ☐

one third of 3 = ☐

one third of 18 = ☐

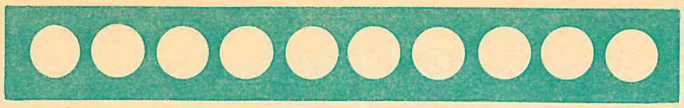
one fourth of 16 = ☐

one fourth of 20 = ☐

one fifth of 40 = ☐

one half of 12 = ☐

# Dividing into Equal Parts with a Remainder



A _____

B _____

C _____

To move a circle to space A, fill in the circle and then draw one in space A.

Move one circle to each of the spaces A, B, and C.

Move another circle to each space. Continue doing this to divide the 10 circles into three equal groups until the groups are as large as possible. There are ☐ circles in each group. There is ☐ circle left over.

one third of 10 = ☐ and ☐ over

* * * * *

Divide these 5 stars into 2 equal parts.

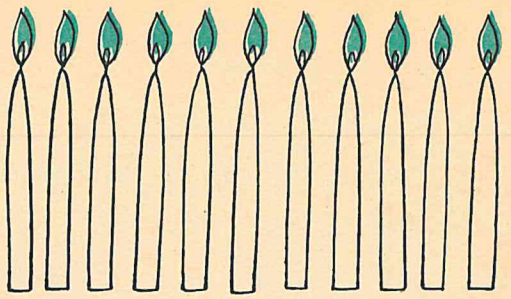
There are ☐ stars in each part.

There is ☐ star left over.

one half of 5 = ☐ and ☐ over

☐ and ☐ over

$2\overline{)5}$



eleven candles

Color one candle red, one candle blue, and one candle green. Color another candle red, another candle blue, and another candle green. Continue in this way to make equal groups of red, blue, and green candles until less than 3 candles are left.

There are ☐ candles in each group.

There are ☐ candles left.

one third of 11 = ☐ and ☐ over

☐ and ☐ over

$3\overline{)11}$

one sixth of 14 = ☐ and ☐ over

one fifth of 13 = ☐ and ☐ over

one third of 10 = ☐ and ☐ over

one half of 7 = ☐ and ☐ over

one fourth of 9 = ☐ and ☐ over

one fourth of 10 = ☐ and ☐ over

John had 11 pencils to share with his brother. Each boy got ☐ pencils, and there was ☐ pencil left over.

# Numbers up to One Hundred Thousand

1 = one
10 = 1 ten = 10 ones
100 = 1 hundred = 10 tens
1,000 = 1 thousand = 10 hundreds
10,000 = 10 thousand
100,000 = 100 thousand

2,000 = 2 thousand
3,000 = ☐ thousand
4,000 = ☐ thousand

five thousand = 5,000
six thousand = ☐,☐☐☐
seven thousand = ☐,☐☐☐
eight thousand = ☐,☐☐☐
nine thousand = ☐,☐☐☐

10,000 = 10 thousand
20,000 = ☐ thousand
30,000 = ☐ thousand
40,000 = ☐ thousand

50 thousand = ☐☐,☐☐☐
60 thousand = ☐☐,☐☐☐
70 thousand = ☐☐,☐☐☐
80 thousand = ☐☐,☐☐☐
90 thousand = ☐☐,☐☐☐
100 thousand = ☐☐☐,☐☐☐

10 hundreds = 1 thousand
☐ hundreds = 2 thousand
☐ hundreds = 3 thousand
☐ hundreds = 4 thousand

2,345 means
2 thousands + 3 hundreds
+ 4 tens + 5 ones.

2 thousands = 2,000
3 hundreds = 300
4 tens = 40
5 ones = 5

2 , 3 4 5 → 2,345

To read 2,345 say: two thousand three hundred forty-five.

56,178 means
5 ten thousands + 6 thousands
+ 1 hundred + 7 tens + 8 ones.

5 ten thousands = 50,000
6 thousands = 6,000
1 hundred = 100
7 tens = 70
8 ones = 8

5 6 , 1 7 8 → 56,178

To read 56,178 say: fifty-six thousand one hundred seventy-eight.

4,204 = ☐ thousand and 204
15,612 = ☐ thousand and 612
8,019 = ☐ thousand and 19
12,045 = ☐ thousand and ☐
36,008 = ☐ thousand and ☐

Count by ones.

| | | | | |
|---|---|---|---|---|
| 96 | | | | 100 |
| 82 | | | | |
| 121 | | | | |

Count by fives.

| | | | | |
|---|---|---|---|---|
| 105 | | | | |
| 230 | | | | |

Count by tens.

| | | | | |
|---|---|---|---|---|
| 420 | | | | |
| 705 | | | | |

Count by twenty-fives.

| | | | |
|---|---|---|---|
| 25 | | | |
| | | | 200 |
| 425 | | | |
| | | | 600 |

A boy bought a book that cost 1 dollar and 63 cents. He gave the store clerk 2 dollars. The clerk counted out change like this: He counted from $1.63 to $2.00. He counted 1¢ for each penny he put out, 5¢ for each nickel he put out, and 25¢ for each quarter he put out.

He said, "$1.64, $1.65, $1.70, $1.75, $2.00."

The change was made up of

[ ] pennies, [ ] nickels,

and [ ] quarter.

The change was worth [ ] ¢.

A purchase that cost $3.20 was paid for with a five-dollar bill. To count out the change with as few coins as you can, say $3.25, $[ ].[ ][ ] $[ ].[ ][ ] $[ ][ ][ ]. The change is made up of [ ] nickel, [ ] quarter, [ ] half dollar, and [ ] dollar bill.

The change is worth $[ ].[ ][ ].

## The Nearest Thousand

There are 10 hundreds in a thousand.

Half of a thousand is 500.

1,400 is nearer to 1,000 than 2,000.

1,600 is nearer to 2,000 than 1,000.

Round off to the nearest thousand:

2,815 is about [ ] thousand.

4,121 is about [ ] thousand.

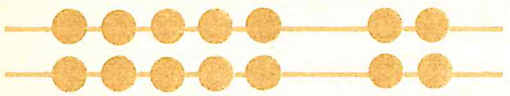
6,550 is about [ ] thousand.

8,349 is about [ ] thousand.

# Sevens

7

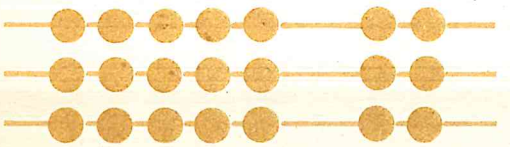
$7 = 5 + 2$



2 X 7

$2 \times 7 = 7 + 7$

$= 5 + 5 + 2 + 2 = \square$



3 X 7

$3 \times 7 = 7 + 7 + 7$

$= 5 + 5 + 5 + 2 + 2 + 2$

$= \square$

$4 \times 7 =$ double $2 \times 7$

$= 2 \times \square = \square$

$5 \times 7 = 4 \times 7 + 7$

$= \square + 7 = \square$

$6 \times 7 =$ double $3 \times 7$

$= 2 \times \square = \square$

$7 \times 7 = 6 \times 7 + 7$

$= \square + 7 = \square$

$8 \times 7 = 7 \times 7 + 7$

$= \square + 7 = \square$

$9 \times 7 = 8 \times 7 + 7$

$= \square + 7 = \square$

$10 \times 7 = 9 \times 7 + 7$

$= \square + 7 = \square$

Count by sevens.

| | | | | |
|---|---|---|---|---|
| 7 | 14 | | | |
| | | | | |

| | | | |
|---|---|---|---|
| 63 + 7 = | 42 + 7 = | 21 + 7 = | 14 + 7 = |
| 28 + 7 = | 49 + 7 = | 35 + 7 = | 56 + 7 = |

Count backwards by sevens.

| | | | | |
|---|---|---|---|---|
| 70 | | | | |
| | | | | |

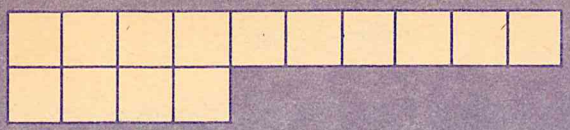
| | |
|---|---|
| $1 \times 7 = \square$ | $6 \times 7 = \square$ |
| $2 \times 7 = \square$ | $7 \times 7 = \square$ |
| $3 \times 7 = \square$ | $8 \times 7 = \square$ |
| $4 \times 7 = \square$ | $9 \times 7 = \square$ |
| $5 \times 7 = \square$ | $10 \times 7 = \square$ |

| | |
|---|---|
| $\square \times 7 = 21$ | $\square \times 7 = 14$ |
| $\square \times 7 = 7$ | $\square \times 7 = 42$ |
| $\square \times 7 = 35$ | $\square \times 7 = 63$ |
| $\square \times 7 = 70$ | $\square \times 7 = 28$ |
| $\square \times 7 = 56$ | $\square \times 7 = 49$ |

A classroom has 5 rows with 7 seats in each row. The number of seats in the room is $\square$

# Dividing by Seven

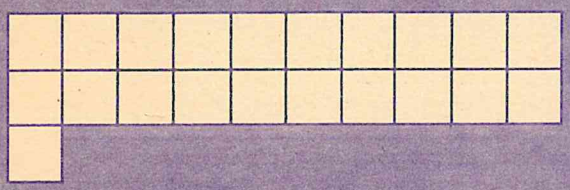




There are 14 boxes here.
Color the first seven boxes red.
Color the next seven boxes blue.
There are ☐ sevens in 14.

$14 \div 7 =$ ☐

$7\overline{)14}$ ☐

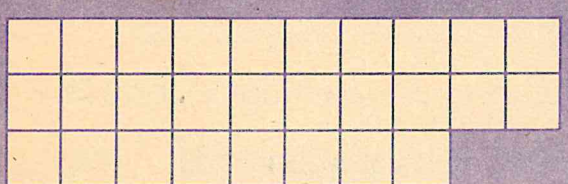


There are 21 boxes here.
Color the first seven boxes red.
Color the next seven boxes blue.
Color the next seven boxes red.

There are ☐ sevens in 21.

$21 \div 7 =$ ☐

$7\overline{)21}$ ☐



There are 28 boxes here. Color the boxes in groups of seven. Color the first group red, the second group blue, the third group red, and so on.

There are ☐ sevens in 28.

$28 \div 7 =$ ☐

$7\overline{)28}$ ☐

How many sevens are there in 35? To find out, take away sevens until none are left.

$$\begin{array}{r} 35 \\ -\ 7 \\ \hline 28 \end{array} \rightarrow \begin{array}{r} 28 \\ -\ 7 \\ \hline 21 \end{array} \rightarrow \begin{array}{r} 21 \\ -\ 7 \\ \hline 14 \end{array} \rightarrow \begin{array}{r} 14 \\ -\ 7 \\ \hline 7 \end{array} \rightarrow \begin{array}{r} 7 \\ -7 \\ \hline 0 \end{array}$$

Count the sevens taken away.
There are ☐ sevens in 35.

$35 \div 7 =$ ☐

$7\overline{)35}$ ☐

How many sevens can you take away from 42?

$$\begin{array}{r} 42 \\ -\ 7 \\ \hline \square \end{array} \rightarrow \begin{array}{r} \square \\ -\ 7 \\ \hline \square \end{array} \rightarrow \begin{array}{r} \square \\ -\ 7 \\ \hline \square \end{array} \rightarrow \begin{array}{r} \square \\ -\ 7 \\ \hline \square \end{array}$$

Continue taking away sevens until you get 0.

There are ☐ sevens in 42.

$42 \div 7 =$ ☐

$7\overline{)42}$ ☐

$7 \times 7 =$ ☐ ☐ $\div 7 = 7$

$8 \times 7 =$ ☐ ☐ $\div 7 = 8$

$9 \times 7 =$ ☐ ☐ $\div 7 = 9$

$10 \times 7 =$ ☐ ☐ $\div 7 = 10$

# Calendars

There are 7 days in a week.

2 weeks = 2 X 7 days = ☐ days

3 weeks = 3 X 7 days = ☐ days

4 weeks = 4 X 7 days = ☐ days

There are 12 months in a year.
The table below shows the number of days in each month.

☐ January has 31 days.

☐ February has 28 or 29 days.

☐ March has 31 days.

☐ April has 30 days.

☐ May has 31 days.

☐ June has 30 days.

☐ July has 31 days.

☐ August has 31 days.

☐ September has 30 days.

☐ October has 31 days.

☐ November has 30 days.

☐ December has 31 days.

In the boxes near the names of the months, number the months from 1 to 12.

April is the ☐ th month.

August is the ☐ th month.

December is the ☐ th month.

## Leap Year

February has 28 days for three years in a row. Every fourth year February has 29 days. A year when February has 29 days is called a **leap year.**
An ordinary year has 365 days.

A leap year has ☐ days.

1960 was a leap year. To find the next ten leap years, count by fours from 1960.

☐ ☐ ☐ ☐

☐ ☐ ☐ ☐

☐ ☐

1962 was not a leap year.

In 1962, January was ☐ days longer than February.

June was ☐ days longer than February.

Mr. Jones was on vacation during March and April. His vacation had ☐ days.

Mr. Brown was on vacation during July and August. His vacation had ☐ days.

Each of the numbers below stands for a month. Circle the months that have 30 days.

1 2 3 4 5 6 7 8 9 10 11 12

# Times a Three-Digit Number

Find 3 X 122. Estimate: about 3 X 100, or ☐

Exact answer:

**First Way**

$$\begin{array}{r} 122 \\ 122 \\ +\ 122 \\ \hline 366 \end{array}$$

**Second Way**

1 hundred + 2 tens + 2 ones

X 3 X 3 X 3

3 hundreds + 6 tens + 6 ones = 366

**Short Way**

$$\begin{array}{r} 122 \\ \times\ 3 \\ \hline 366 \end{array}$$

For the short way, think: 3 X 2 = 6; 3 X 2 tens = 6 tens;

3 X 1 hundred = 3 hundreds.

Find 4 X 121. Estimate: about 4 X 100, or ☐

**First Way**

+

☐☐☐

**Second Way**

☐ hundred + ☐ tens + ☐ one

X 4 X 4 X 4

☐ hundreds + ☐ tens + ☐ ones

= ☐☐☐

**Short Way**

$$\begin{array}{r} 121 \\ \times\ 4 \\ \hline \square\square\square \end{array}$$

Multiply by the short way.

$$\begin{array}{r} 214 \\ \times\ 2 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 321 \\ \times\ 3 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 441 \\ \times\ 2 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 412 \\ \times\ 2 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 111 \\ \times\ 4 \\ \hline \square\square\square \end{array}$$

$$\begin{array}{r} 112 \\ \times\ 3 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 123 \\ \times\ 3 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 142 \\ \times\ 1 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 222 \\ \times\ 3 \\ \hline \square\square\square \end{array} \qquad \begin{array}{r} 211 \\ \times\ 4 \\ \hline \square\square\square \end{array}$$

# Times a Three-Digit Number with Dollars and Cents

Find 3 X $1.13. Estimate: about 3 X 1 dollar, or ☐ dollars

Exact answer:

**First Way**

$1.13
1.13
+ 1.13
$ ☐.☐☐

**Second Way**

1 dollar + 1 dime + 3 pennies
X 3 X 3 X 3
☐ dollars + ☐ dimes + ☐ pennies
= $ ☐.☐☐

**Short Way**

$1.13
X 3
$ ☐.☐☐

For the short way, think: 3 X 3 pennies = ☐ pennies;
3 X 1 dime = ☐ dimes; 3 X 1 dollar = ☐ dollars.

---

Find 4 X $2.12 Estimate: about 4 X 2 dollars, or ☐ dollars

**First Way**

+
$ ☐.☐☐

**Second Way**

☐ dollars + ☐ dime + ☐ pennies
X 4 X 4 X 4
☐ dollars + ☐ dimes + ☐ pennies
= $ ☐.☐☐

**Short Way**

$2.12
X 4
$ ☐.☐☐

---

Multiply by the short way.

$3.13 X 3 = $ ☐.☐☐

$1.21 X 4 = $ ☐.☐☐

$3.33 X 2 = $ ☐.☐☐

$2.14 X 2 = $ ☐.☐☐

$1.11 X 3 = $ ☐.☐☐

$1.42 X 2 = $ ☐.☐☐

$2.22 X 3 = $ ☐.☐☐

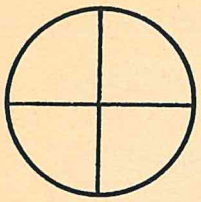
$2.13 X 3 = $ ☐.☐☐

$4.14 X 2 = $ ☐.☐☐

$1.24 X 2 = $ ☐.☐☐

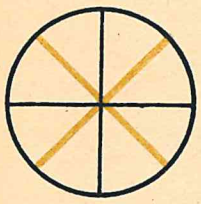
# Eighths

The space inside a circle is called a **disk.**



This disk has been cut into 4 equal parts.

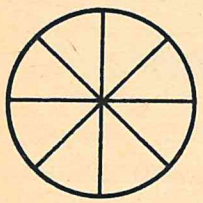
Each part is one fourth of the disk.



The colored lines cut each fourth of the disk in half.

Now there are 8 equal parts.
Each part is called an **eighth.**

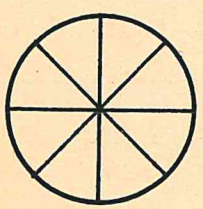
There are ☐ eighths in a whole.



In this disk color 2 eighths that are next to each other.

Underline the right answer.

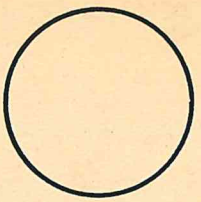
2 eighths = { 1 fourth / 1 half / 1 whole }

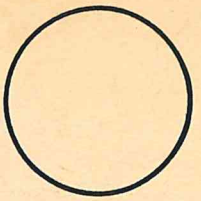


In this disk color 4 eighths that are next to each other.

Underline the right answer.

4 eighths = { 1 fourth / 1 half / 1 whole }





Divide each disk into eighths.

2 wholes = ☐ eighths.

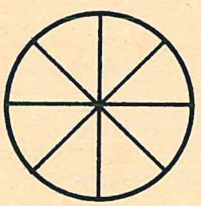
Color 12 eighths.

12 eighths

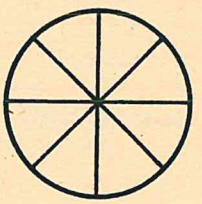
= 1 whole and ☐ eighths.

= 1 whole and ☐ fourths.

= 1 whole and ☐ half.



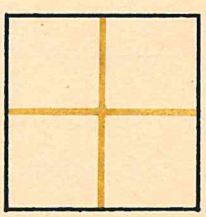
A



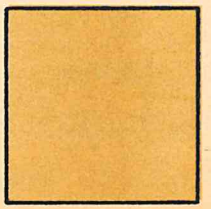
B

In disk A color 6 eighths.
In disk B color 3 fourths.
Compare them.
Underline the right answer.

6 eighths is { more than / the same as / less than } 3 fourths.



This square is divided into fourths.
Divide it into eighths.



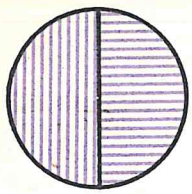
Divide this square into eighths.

# Adding and Subtracting Wholes, Halves, or Fourths

For each picture below, underline the correct words.

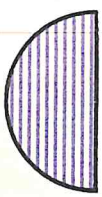
{ one half of a disk / one fourth of a disk / one whole disk }

{ one half of a disk / one fourth of a disk / one whole disk }

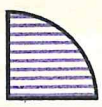


{ one half of a disk / one fourth of a disk / one whole disk }

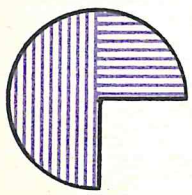
one half + one half = { one half / one fourth / one whole }



{ one half of a disk / one fourth of a disk / one whole disk }

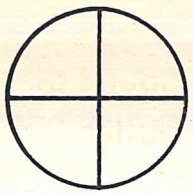


{ one fourth of a disk / two fourths of a disk / three fourths of a disk }



{ one fourth of a disk / two fourths of a disk / three fourths of a disk }

one half + one fourth = { one fourth / two fourths / three fourths }



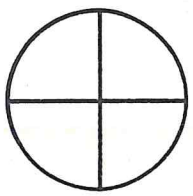
Color one fourth of the disk.

The part that is not colored

is { one fourth / two fourths / three fourths }

one whole minus one fourth

= { one fourth / two fourths / three fourths }



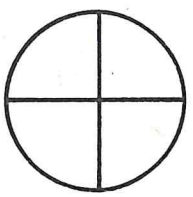
Color one half of the disk.

The part that is not colored

is { one half / one fourth / one whole }

one whole minus one half

= { one half / one fourth / one whole }



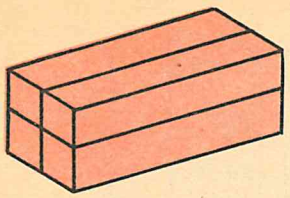
Color three fourths of the disk.

one whole minus three fourths

= { one half / one fourth / one whole }

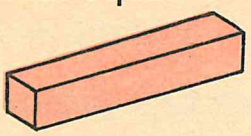
# Weights in Pounds and Ounces



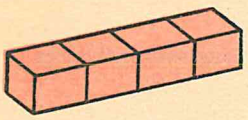


This is a pound of butter.

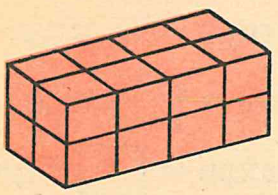
It is divided into four equal bars like this:



Each bar weighs one fourth of a pound.



This bar of butter has been divided into fourths.



In this pound of butter, each fourth has been divided into fourths. The number of equal pieces is 4 X 4 = 16.

Each piece weighs one **ounce.**

There are 16 ounces in a pound.

one half of a pound

= one half of 16 ounces

= ☐ ounces

one fourth of a pound

= one fourth of 16 ounces

= ☐ ounces

2 pounds = 16 ounces + 16 ounces

= ☐ ounces

**lb.** is a short way of writing pound.

**oz.** is a short way of writing ounce.

2 lb. means 2 pounds.

3 oz. means 3 ounces.

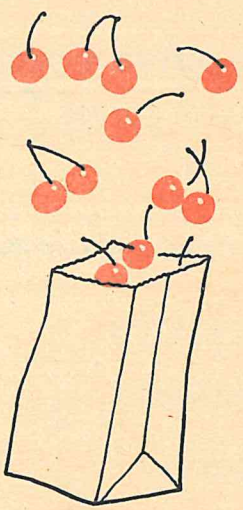
One half of a pound is ☐ oz. more than 7 oz.

One half of a pound is ☐ oz. more than 6 oz.

One half of a pound is ☐ oz. more than 5 oz.

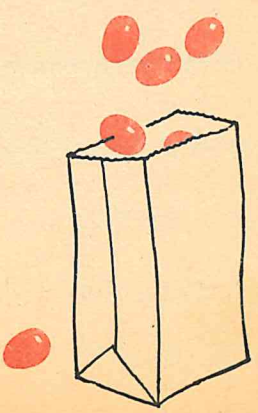
One quarter of a pound is ☐ oz. less than 5 oz.

One pound is ☐ oz. more than 14 oz.



The clerk has put 7 oz. of cherries into a bag. He needs ☐ oz. more to make a half pound.

The clerk has put 14 oz. of plums into a bag. He needs ☐ oz. more to make a pound.



# Gallons, Quarts, Pints, and Cups

Milk is sold in **quart** containers.
Half of a quart is a **pint.**

☐ pints = 1 quart

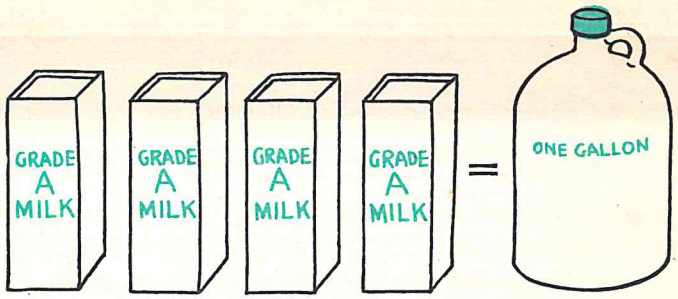
Half of a pint is called a **cup.**

☐ half pints = 1 pint

☐ cups = 1 pint

1 cup = one fourth of a quart

☐ cups = 1 quart




4 quarts = 1 gallon

one half of a gallon = ☐ quarts

one fourth of a gallon = ☐ quart

There are ☐ pints in a gallon.

---

Mrs. Jones poured 3 cups of milk from a full quart container of milk. How many cups of milk were left in the container?

Answer: ☐

---

If a pint of ice cream serves 4 people, then a quart of ice cream serves ☐ people.

---

How many cups are there

in 2 quarts? Answer: ☐

in 3 quarts? Answer: ☐

in 4 quarts? Answer: ☐

---

How many pints are there

in 2 quarts? Answer: ☐

in 3 quarts? Answer: ☐

in 4 quarts? Answer: ☐

---

1 gallon = 4 quarts, and

each quart = 4 cups, so

1 gallon = 4 X 4 cups = 16 cups.

one half of a gallon = ☐ cups

one fourth of a gallon = ☐ cups

one eighth of a gallon = ☐ cups

---

How many cups are there in a quart and a half? Answer: ☐

How many cups are there in two quarts and a half? Answer: ☐

How many quarts are there in a gallon and a half? Answer: ☐

---

If a gallon of gasoline costs 31¢, what is the cost of 3 gallons?

Answer: ☐

# A Remainder of Four, Five, or Six

Count by sevens up to 42, and circle the numbers that are less than 25.

7 14 21 28 35 42

$3 \times 7 = 21$ $21 + 4 = 25$

3 and 4 left

$7 \overline{)25}$

---

Count by fives to 30, and circle the numbers that are less than 24.

☐ ☐ ☐ ☐ ☐ ☐

☐ and ☐ left

$5 \overline{)24}$

---

Count by sixes to 36, and circle the numbers that are less than 35.

☐ ☐ ☐ ☐ ☐ ☐

☐ and ☐ left

$6 \overline{)35}$

---

☐ and ☐ left

$5 \overline{)29}$

☐ and ☐ left

$7 \overline{)15}$

☐ and ☐ left

$7 \overline{)34}$

☐ and ☐ left

$6 \overline{)16}$

---

John saved 34 pennies. He divided the pennies into groups of five. There were ☐ groups of five, and ☐ pennies left. He exchanged each group of five pennies for a nickel. Then he had ☐ nickels and ☐ pennies.

---

| OCTOBER | | | | | | |
|---|---|---|---|---|---|---|
| S | M | T | W | T | F | S |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |

The month shown on this page of a calendar has 31 days.

The lines divide the days into ☐ groups of seven. There are ☐ groups of seven, and ☐ days left. Each group of seven days is a week. October has ☐ weeks and ☐ days.

---

15 cookies are shared equally by 7 children. Each child gets ☐ cookies, and there is ☐ cookie left.

---

22 cents are shared equally by 6 children. Each child gets ☐ cents, and there are ☐ cents left.

---

54 days = ☐ weeks and ☐ days

## Roman Numerals up to Ten

I II III IV V VI

VII VIII IX X

These are Roman numerals.

They are sometimes used on clocks, in books, and on buildings.

I means 1

II means 1 + 1 or ☐

III means 1 + 1 + 1 or ☐

When the same Roman numerals are written one after the other, it is like adding them.

V means 5

VI means 5 + 1 or ☐

IV means 5 − 1 or ☐

In Roman numerals, a smaller number written after a larger number means **add them.**

A smaller number written before a larger number means **subtract them.**

VI means I more than V

IV means I less than V

VII means 5 + 1 + 1 or ☐

VIII means 5 + 1 + 1 + 1 or ☐

X means 10

IX means I less than X

IX means 10 − 1 or ☐

Write in Roman numerals:

3 = ☐ 4 = ☐ 6 = ☐

10 = ☐ 7 = ☐ 9 = ☐

## A Number Times Zero

The Bears played a five-inning game against the Tigers. This is how the teams scored:

| | | | | | |
|---|---|---|---|---|---|
| Bear | 0 | 0 | 0 | 0 | 0 |
| Tigers | 1 | 1 | 1 | 1 | 1 |

The scorekeeper added the scores like this:

| Bears | Tigers |
|---|---|
| 0 | 1 |
| 0 | 1 |
| 0 | 1 |
| 0 | 1 |
| +0 | +1 |
| ☐ | ☐ |

Final Score:
Bears ☐
Tigers ☐

Tom did it a short way:

5 X 0 = ☐ 5 X 1 = ☐

| | | |
|---|---|---|
| 0 | 0 | |
| 0 | 0 | 3 X 0 = ☐ |
| + 0 | 0 | 4 X 0 = ☐ |
| ☐ | + 0 | |
| | ☐ | |

Any number times 0 = ☐

Write in ordinary numerals:

II = ☐ X = ☐ IV = ☐

IX = ☐ VII = ☐ V = ☐

VI = ☐ II = ☐ VIII = ☐

6 X 1 = ☐ 6 X 0 = ☐

8 X 1 = ☐ 8 X 0 = ☐

# Multiplying with Exchange



Multiply 2 X 36.

Estimate:

36 is about 40.
2 X 36 is about
2 X 40, or ☐

Exact Answer:

**First Way**

$$\begin{array}{r} 36 \\ +\ 36 \\ \hline \square\square \end{array}$$

**Second Way**

Think:

$$\begin{array}{rcl} & & 36 \\ & & \times\ 2 \\ 2 \times 6 & = & 12 \\ 2 \times 30 & = & 60 \\ \hline & & 72 \end{array}$$

Add to get this

Multiply 3 X 18.

Estimate: about 3 X 20, or ☐

**First Way**

$$\begin{array}{r} 18 \\ 18 \\ +\ 18 \\ \hline \square\square \end{array}$$

**Second Way**

$$\begin{array}{rcl} & & 18 \\ & & \times\ 3 \\ 3 \times 8 & = & \square\square\square \\ 3 \times 10 & = & \square\square\square \\ \hline & & \square\square \end{array}$$

Multiply 4 X 17.

Estimate: about 4 X 20, or ☐

**First Way**

$$\begin{array}{r} 17 \\ 17 \\ 17 \\ +\ 17 \\ \hline \square\square \end{array}$$

**Second Way**

$$\begin{array}{rcl} & & 17 \\ & & \times\ 4 \\ 4 \times 7 & = & \square\square\square \\ 4 \times 10 & = & \square\square\square \\ \hline & & \square\square \end{array}$$

Multiply 2 X 29.

**First Way**

$$\begin{array}{r} 29 \\ +\ 29 \\ \hline \square\square \end{array}$$

**Second Way**

$$\begin{array}{rcl} & & 29 \\ & & \times\ 2 \\ 2 \times 9 & = & \square\square\square \\ 2 \times 20 & = & \square\square\square \\ \hline & & \square\square \end{array}$$

Multiply 3 X 25.

**First Way**

$$\begin{array}{r} 25 \\ 25 \\ +\ 25 \\ \hline \square\square \end{array}$$

**Second Way**

$$\begin{array}{rcl} & & 25 \\ & & \times\ 3 \\ 3 \times 5 & = & \square\square\square \\ 3 \times 20 & = & \square\square\square \\ \hline & & \square\square \end{array}$$

Multiply 2 X 46.

**First Way**

$$+\ \underline{\quad\quad} \\ \square\square$$

**Second Way**

$$\begin{array}{rcl} & & 46 \\ & & \times\ 2 \\ 2 \times 6 & = & \square\square\square \\ 2 \times 40 & = & \square\square\square \\ \hline & & \square\square \end{array}$$

Multiply 3 X 17.

**First Way**

$$+\ \underline{\quad\quad} \\ \square\square$$

**Second Way**

$$\begin{array}{rcl} & & 17 \\ & & \times\ 3 \\ 3 \times 7 & = & \square\square\square \\ 3 \times 10 & = & \square\square\square \\ \hline & & \square\square \end{array}$$

# Multiplying with Exchange the Short Way

Multiply 4 X 17.
Think: 4 X 7 = 28 = 2 tens and 8 ones.
Write the 8 in the ones place.
Think: 4 X 1 ten = 4 tens.
4 tens and 2 tens = 6 tens
Write the 6 in the tens place.

$$\begin{array}{r} 17 \\ \times\ 4 \\ \hline 68 \end{array}$$

Multiply 5 X 16.
Think: 5 X 6 = 30 = 3 tens and 0 ones.
Write the 0 in the ones place.
Think: 5 X 1 ten = 5 tens.
5 tens and 3 tens = 8 tens
Write the 8 in the tens place.

$$\begin{array}{r} 16 \\ \times\ 5 \\ \hline \square\square \end{array}$$

Multiply by the short way, and check by addition.

| | | | | | |
|---|---|---|---|---|---|
| 12 | 18 | 13 | 27 | 15 | 15 |
| × 6 | × 5 | × 4 | × 3 | × 4 | × 5 |
| ☐☐ | ☐☐ | ☐☐ | ☐☐ | ☐☐ | ☐☐ |
| Check: | Check: | Check: | Check: | Check: | Check: |
| 12 | 18 | 13 | 27 | 15 | 15 |
| 12 | 18 | 13 | 27 | 15 | 15 |
| 12 | 18 | 13 | +27 | 15 | 15 |
| 12 | 18 | +13 | ☐☐ | +15 | 15 |
| +12 | +18 | ☐☐ | | ☐☐ | +15 |
| ☐☐ | ☐☐ | | | | ☐☐ |

Multiply by the short way.

| | | | | | |
|---|---|---|---|---|---|
| 13 | 17 | 12 | 16 | 11 | 12 |
| × 3 | × 3 | × 4 | × 4 | × 5 | × 5 |

# Multiplying by a Number of Tens



| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Count by ones. | 1 | 2 | | | | | | | | 10 |
| Count by twos. | 2 | 4 | | | | | | | | |
| Count by threes. | 3 | 6 | | | | | | | | |
| Count by fours. | 4 | 8 | | | | | | | | |

10 X 1 = ☐
10 X 2 = ☐
10 X 3 = ☐
10 X 4 = ☐
10 X 5 = ☐ 10 X 6 = ☐ 10 X 7 = ☐ 10 X 8 = ☐ 10 X 9 = ☐

---

20 X 1 = 2 X (10 X 1) = 2 X 10 = ☐
20 X 2 = 2 X (10 X 2) = 2 X ☐ = ☐
20 X 3 = 2 X (10 X 3) = 2 X ☐ = ☐
20 X 4 = 2 X (10 X 4) = 2 X ☐ = ☐

20 X 1 = ☐
20 X 2 = ☐
20 X 3 = ☐
20 X 4 = ☐

---

30 X 1 = 3 X (10 X 1) = 3 X ☐ = ☐
30 X 2 = 3 X (10 X 2) = 3 X ☐ = ☐
30 X 3 = 3 X (10 X 3) = 3 X ☐ = ☐

30 X 1 = ☐
30 X 2 = ☐
30 X 3 = ☐

---

12 tens = 10 tens + 2 tens = 1 hundred + 2 tens = 1 2 0
15 tens = 10 tens + 5 tens = ☐ hundred + 5 tens = ☐☐☐
18 tens = 10 tens + 8 tens = ☐ hundred + 8 tens = ☐☐☐
30 X 4 = 3 X 40 = 3 X 4 tens = 12 tens = 1 2 0
30 X 5 = 3 X 50 = 3 X 5 tens = 15 tens = ☐☐☐
30 X 6 = 3 X 60 = 3 X 6 tens = ☐☐ tens = ☐☐☐

---

40 X 1 = 4 tens = ☐
40 X 2 = ☐ tens = ☐
40 X 3 = ☐ tens = ☐
40 X 4 = ☐ tens = ☐

50 X 1 = ☐ tens = ☐
50 X 2 = ☐ tens = ☐
50 X 3 = ☐ tens = ☐
50 X 4 = ☐ tens = ☐

60 X 1 = ☐ tens = ☐
60 X 2 = ☐ tens = ☐
60 X 3 = ☐ tens = ☐
60 X 4 = ☐ tens = ☐

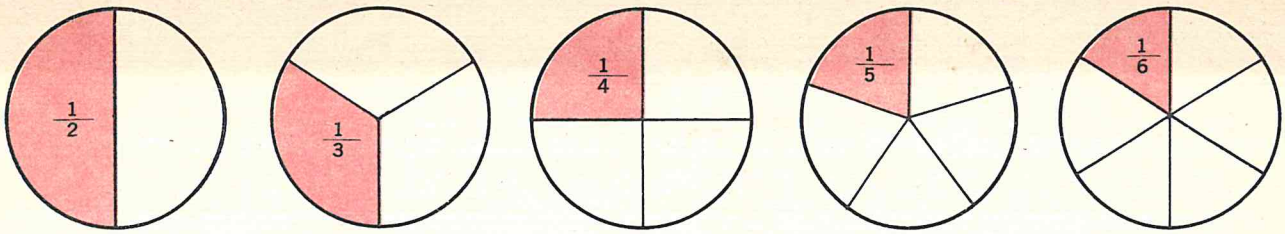
---

70 X 1 = ☐ tens = ☐
70 X 2 = ☐ tens = ☐
70 X 3 = ☐ tens = ☐
70 X 4 = ☐ tens = ☐

80 X 1 = ☐ tens = ☐
80 X 2 = ☐ tens = ☐
80 X 3 = ☐ tens = ☐
80 X 4 = ☐ tens = ☐

90 X 1 = ☐ tens = ☐
90 X 2 = ☐ tens = ☐
90 X 3 = ☐ tens = ☐
90 X 4 = ☐ tens = ☐

# Fractions




one half | one third | one fourth | one fifth | one sixth

$\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ | $\frac{1}{5}$ | $\frac{1}{6}$

$\frac{1}{2}$ means one half.

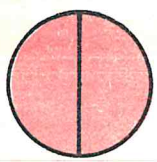
$\frac{1}{3}$ means one third.

$\frac{1}{4}$ means one fourth.

The 2 under the line means divide a whole into 2 equal parts called halves.
The 1 above the line says take 1 of them.

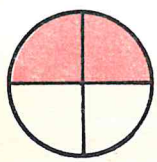
The 3 under the line means divide a whole into 3 equal parts called thirds.
The 1 above the line says take 1 of them.

The 4 under the line means divide a whole into 4 equal parts called fourths.
The 1 above the line says take 1 of them.

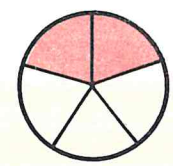


$\frac{2}{2}$ means 2 halves.

$\frac{2}{3}$ means 2 thirds.



$\frac{2}{4}$ means 2 fourths.



$\frac{2}{5}$ means 2 fifths.

$\frac{3}{2}$ means ☐ halves.

$\frac{4}{5}$ means ☐ fifths.

$\frac{5}{6}$ means ☐ sixths.

$\frac{7}{3}$ means ☐ thirds.

$\frac{5}{8}$ means ☐ eighths.

$\frac{2}{4}$ means ☐ fourths.

$\frac{1}{2}$ means 1 _____

$\frac{3}{3}$ means 3 _____

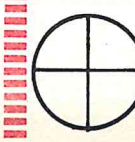
$\frac{4}{8}$ means 4 _____

$\frac{2}{6}$ means 2 _____

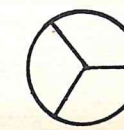
$\frac{3}{4}$ means 3 _____

$\frac{3}{5}$ means 3 _____

Color enough parts of a whole to show what each fraction means.



$\frac{3}{4}$



$\frac{1}{3}$

$\frac{4}{5}$

$\frac{2}{2}$

Write out in words what each fraction means.

$\frac{4}{6}$ = four sixths

$\frac{3}{5}$ = _____

$\frac{5}{2}$ = _____

$\frac{1}{4}$ = _____

$\frac{2}{3}$ = _____

Write the fractions described by these words:

one third = $\frac{1}{3}$

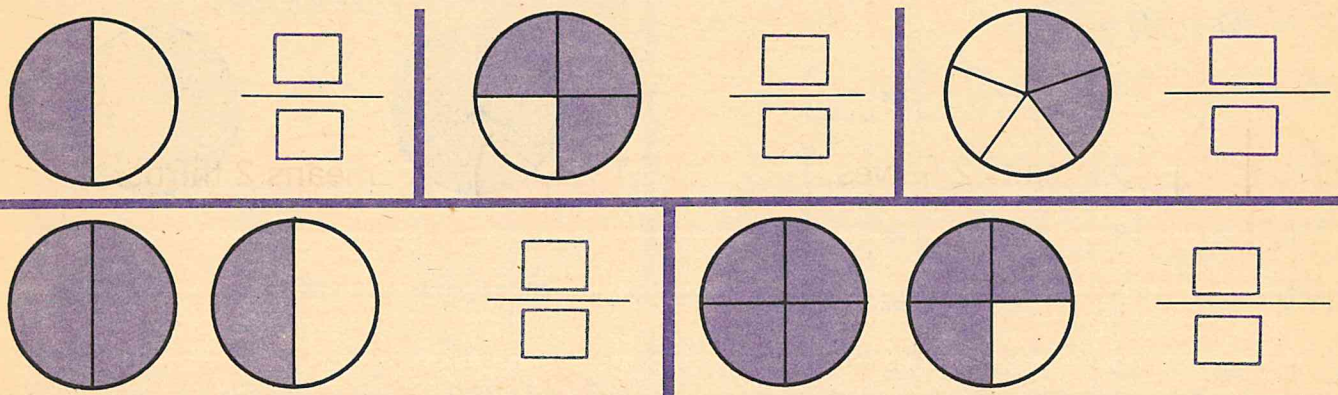
two fourths = $\frac{\square}{\square}$

five sixths = $\frac{\square}{\square}$

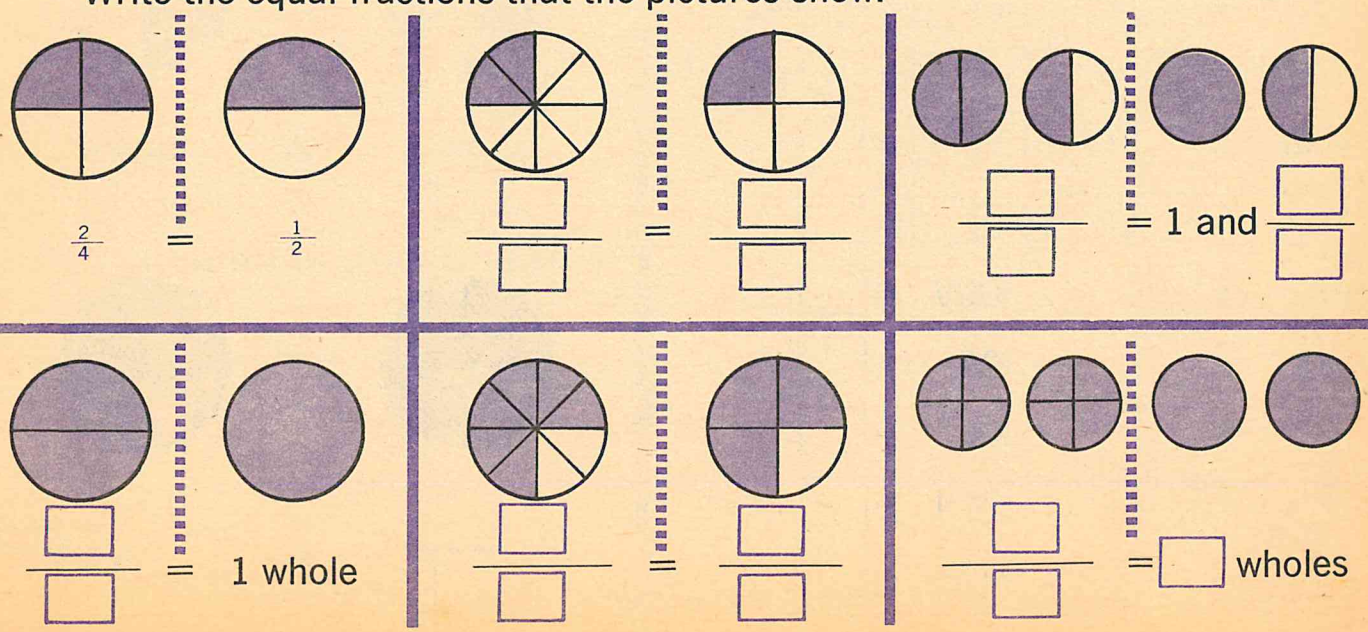
six eighths =

four fifths =

In the pictures below, each disk stands for one whole.
Write the fraction shown by the colored part of each picture.



Each pair of pictures shows equal parts of a whole.
Write the equal fractions that the pictures show.



# Roman Numerals up to Thirty

XI = 10 + 1 = ☐

XII = 10 + 2 = ☐

XIII = 10 + 3 = ☐

V = 5 IV = 5 − 1 = 4

XIV = 10 + 4 = ☐

XV = 10 + 5 = ☐

XVI = 10 + 5 + 1 = ☐

XVII = 10 + 5 + 2 = ☐

XVIII = 10 + 5 + 3 = ☐

X = 10 IX = 10 − 1 = 9

XIX = 10 + 9 = ☐

XX = 10 + 10 = ☐

XXI = ☐ + ☐ + ☐ = ☐

XXII = ☐ + ☐ + ☐ = ☐

XXIII = ☐ + ☐ + ☐ = ☐

XXIV = ☐ + ☐ + ☐ = ☐

XXV = ☐ + ☐ + ☐ = ☐

XXVI = ☐ + ☐ + ☐ + ☐ = ☐

XXVII = ☐ + ☐ + ☐ + ☐ = ☐

XXVIII = ☐ + ☐ + ☐ + ☐ = ☐

XXIX = ☐ + ☐ + ☐ = ☐

XXX = ☐ + ☐ + ☐ = ☐

XII = ☐ XXIV = ☐

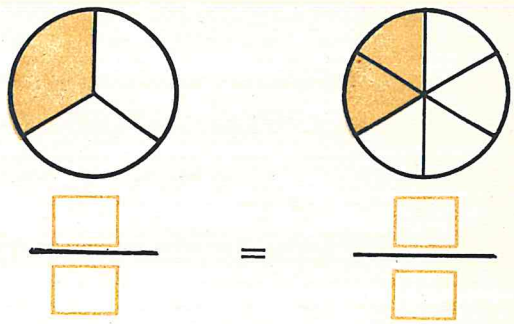
XIX = ☐ XVI = ☐

XV = ☐ XX = ☐

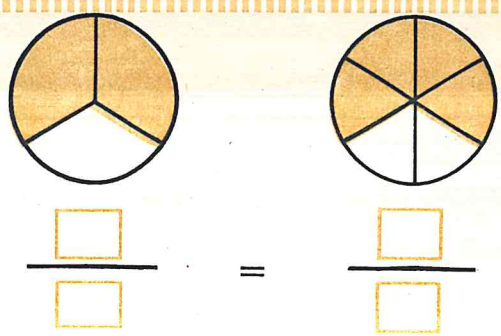
XXI = ☐ XVIII = ☐

XXIX = ☐ XIV = ☐

Write the equal fractions shown in the colored part of each picture.

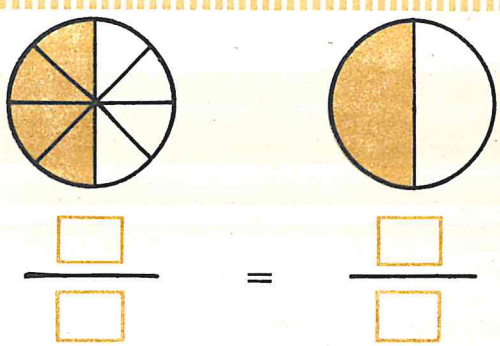


☐/☐ = ☐/☐

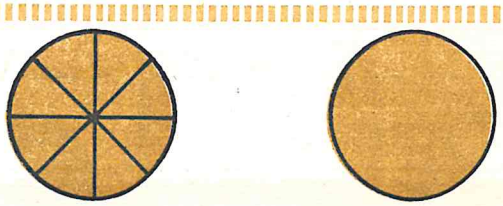


☐/☐ = ☐/☐

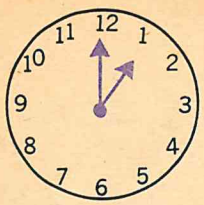
☐/☐ = ☐ whole



☐/☐ = ☐/☐

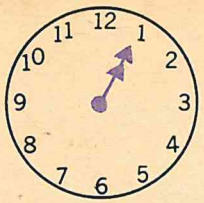


☐/☐ = ☐ whole



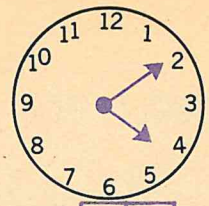
1:00

1 o'clock



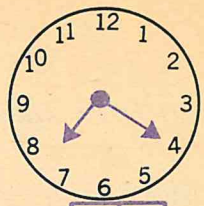
1:05

5 minutes past 1



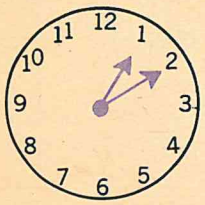
4:□□

□ minutes past 4



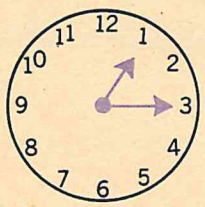
7:□□

□ minutes after 7



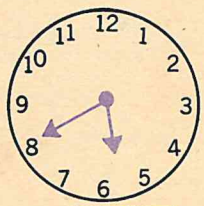
1:10

10 minutes past 1



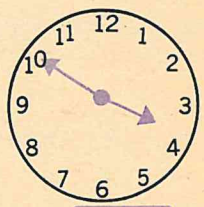
1:15

A quarter past 1



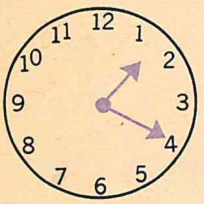
5:□□

□ minutes to 6



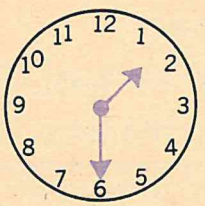
3:□□

□ minutes to 4



1:20

20 minutes past 1



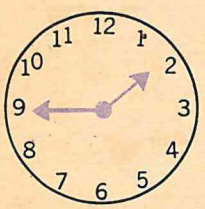
1:30

Half past 1

We say A.M. for times after midnight and before noon.

We say P.M. for times after noon and before midnight.

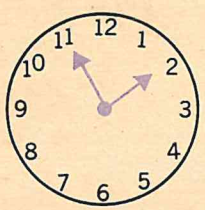
12:10 P.M. means 10 minutes after noon.



1:45

15 minutes before 2

A quarter to 2



1:55

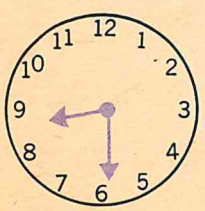
5 minutes before 2

12:01 P.M. means □ minute after noon.

12:01 A.M. means □ minute after midnight.

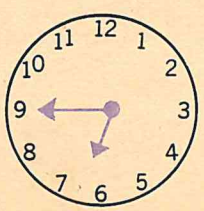
12:05 A.M. means □ minutes after midnight.

1:15 P.M. means 1 and $\frac{1}{4}$ hours after noon.



□:30

Half past □



□:45

A quarter to □

2:15 P.M. means □ and $\frac{\square}{\square}$ hours after noon.

3:15 P.M. means □ and $\frac{\square}{\square}$ hours after noon.

# Adding Three-Digit Numbers with One Exchange

Add 215 + 138.

Estimate: about 200 + 100, or 300

| | |
|---|---|
| Exact answer: | 2 1 5 + 1 3 8 |
| Add the ones: 5 + 8 = | 1 3 |
| Add the tens: 10 + 30 = | 4 0 |
| Add the hundreds: 200 + 100 = | 3 0 0 |
| Total | = 3 5 3 |

Add 427 + 148.

Estimate: about 400 + 100, or 500

| | |
|---|---|
| Exact answer: | 4 2 7 + 1 4 8 |
| Add the ones: 7 + 8 = | □□ |
| Add the tens: 20 + 40 = | □□ |
| Add the hundreds: 400 + 100 = | □□□ |
| Total | = □□□ |

Add 324 + 157.

Estimate: about 300 + 200, or 500

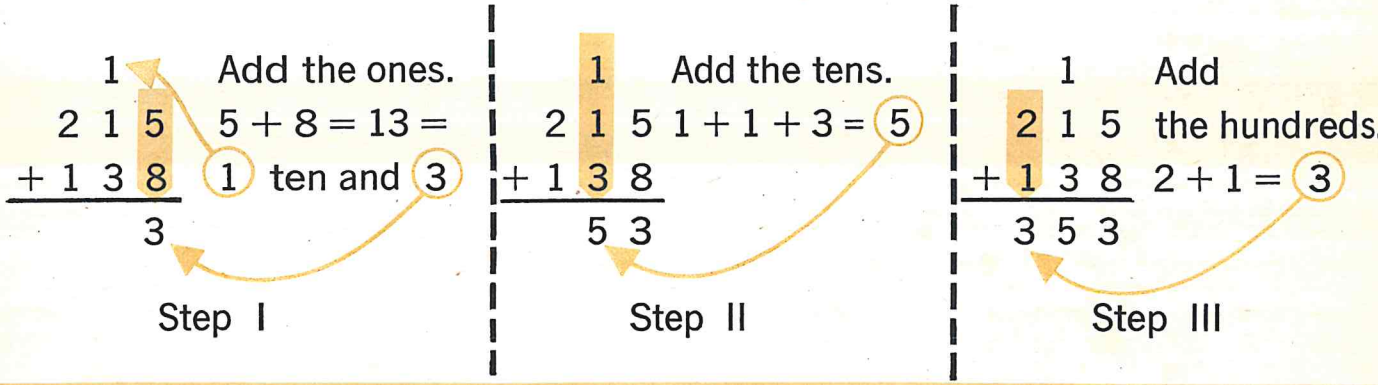
| | |
|---|---|
| Exact answer: | 3 2 4 + 1 5 7 |
| Add the ones: 4 + 7 = | □□ |
| Add the tens: 20 + 50 = | □□ |
| Add the hundreds: 300 + 100 = | □□□ |
| Total | = □□□ |

Add 609 + 116.

Estimate: about 600 + 100, or 700

| | |
|---|---|
| Exact answer: | 6 0 9 + 1 1 6 |
| Add the ones: 9 + 6 = | □□ |
| Add the tens: 0 + 10 = | □□ |
| Add the hundreds: 600 + 100 = | □□□ |
| Total | = □□□ |

## A Short Way of Adding




Add in the short way.

| | | | | |
|---|---|---|---|---|
| 2 4 6 | 3 1 7 | 2 4 6 | 4 1 9 | 1 2 9 |
| + 1 1 8 | + 1 2 7 | + 1 2 6 | + 1 2 5 | + 2 1 3 |
| □□□ | □□□ | □□□ | □□□ | □□□ |

Add 152 + 283. Estimate: about 200 + 300, or 500

```
  1 5 2
+ 2 8 3
-------
  4 3 5
```

2 + 3 = 5
50 + 80 = 130
100 + 200 = 300
Total = 435

**Short Way:**

```
  1 5 2
+ 2 8 3
-------
      5
```

Add the ones.

Step I

```
  1
  1 5 2
+ 2 8 3
-------
  4 3 5
```

Add the tens.
5 tens + 8 tens = 13 tens = 1 hundred + 3 tens

Step II

```
  1
  1 5 2
+ 2 8 3
-------
  4 3 5
```

Step III

Add 271 + 380. Estimate: about 300 + 400, or 700

```
  2 7 1
+ 3 8 0
-------
  □ □ □
```

1 + 0 = □
70 + 80 = □□□
200 + 300 = □□□
Total = □□□

**Short Way:**

```
  2 7 1
+ 3 8 0
-------
    □
```

Add the ones.

Step I

```
  1
  2 7 1
+ 3 8 0
-------
  □ □ □
```

Add the tens.
7 tens + 8 tens = 15 tens = 1 hundred + 5 tens

Step II

```
  1
  2 7 1
+ 3 8 0
-------
  □ □ □
```

Step III

Add in the short way.

```
  2 8 6
+ 1 4 1
-------
  □ □ □
```

```
  4 6 2
+ 1 5 2
-------
  □ □ □
```

```
  3 7 2
+ 2 6 6
-------
  □ □ □
```

```
  2 9 1
+ 1 9 3
-------
  □ □ □
```

```
  4 3 3
+ 1 8 0
-------
  □ □ □
```

```
  1 4 3
+ 3 7 5
-------
  □ □ □
```

```
  2 1 6
+ 2 1 8
-------
  □ □ □
```

```
  3 1 2
+ 4 1 8
-------
  □ □ □
```

```
  1 7 4
+ 2 5 1
-------
  □ □ □
```

```
  2 9 1
+ 2 4 2
-------
  □ □ □
```

```
  1 2 2
  1 1 6
+ 2 0 4
-------
  □ □ □
```

```
  2 0 8
  1 3 5
+ 1 1 1
-------
  □ □ □
```

```
  1 6 2
    5 1
+   2 1
-------
  □ □ □
```

```
  1 4 1
  2 5 2
+   5 3
-------
  □ □ □
```

```
  2 8 4
    8 1
+   2 1
-------
  □ □ □
```

# Adding Three-Digit Numbers with Two Exchanges

Add 168 + 274. Estimate: about 200 + 300, or ☐

| | |
|---|---|
| | 1 6 8<br>+2 7 4 |
| 8+4 = | ☐☐ |
| 60+70 = | ☐☐☐ |
| 100+200= | ☐☐☐ |
| Total = | ☐☐☐ |

**Short Way:**

| Step I | Step II | Step III |
|---|---|---|
| 1<br>1 6 8 8+4=<br>+2 7 4 1 ten+2<br>2 | 1 1 1 ten+6 tens<br>1 6 8 +7 tens=<br>+2 7 4 14 tens=<br>4 2 1 hundred<br>+4 tens | 1 1<br>1 6 8<br>+2 7 4<br>4 2 |

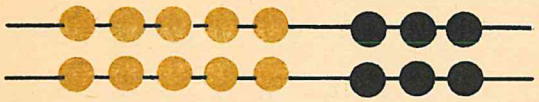
Add in the short way.

| | | | | |
|---|---|---|---|---|
| 1 3 5<br>+ 2 8 6<br>☐☐☐ | 1 5 8<br>+ 1 8 7<br>☐☐☐ | 2 6 9<br>+ 2 3 6<br>☐☐☐ | 1 6 8<br>+ 1 7 5<br>☐☐☐ | 1 2 6<br>+ 1 9 6<br>☐☐☐ |
| 2 6 8<br>+ 3 9 6<br>☐☐☐ | 2 2 9<br>+ 2 7 2<br>☐☐☐ | 1 2 6<br>+ 1 9 7<br>☐☐☐ | 2 2 6<br>+ 1 7 4<br>☐☐☐ | 1 0 8<br>+ 1 9 3<br>☐☐☐ |
| 1 5 6<br>2 1<br>+ 4 8<br>☐☐☐ | 1 2 3<br>3 7<br>+ 2 1<br>☐☐☐ | 1 3 4<br>3 1<br>+ 8 2<br>☐☐☐ | 2 1 5<br>1 5<br>+ 8 4<br>☐☐☐ | 1 7 2<br>2 0 4<br>+ 8 1<br>☐☐☐ |

| | | |
|---|---|---|
| $\frac{1}{2}$ of 8 = ☐ | $\frac{1}{5}$ of 10 = ☐ | $\frac{2}{2}$ = ☐ whole |
| $\frac{1}{4}$ of 8 = ☐ | $\frac{1}{8}$ of 16 = ☐ | $\frac{4}{2}$ = ☐ wholes |
| $\frac{1}{3}$ of 15 = ☐ | $\frac{1}{8}$ of 8 = ☐ | $\frac{6}{2}$ = ☐ wholes |
| $\frac{1}{6}$ of 18 = ☐ | $\frac{1}{4}$ of 4 = ☐ | $\frac{8}{4}$ = ☐ wholes |

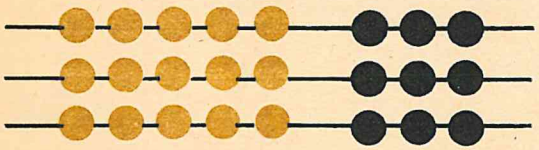
# Eights

$8 = 5 + 3$



$2 \times 8 = 8 + 8$

$= 5 + 5 + 3 + 3 = \square$



$3 \times 8 = 8 + 8 + 8$

$= 5 + 5 + 5 + 3 + 3 + 3$

$= \square$

$4 \times 8 =$ double $2 \times 8$

$= 2 \times \square = \square$

$5 \times 8 = 4 \times 8 + 8$

$= \square + 8 = \square$

$6 \times 8 =$ double $3 \times 8$

$= 2 \times \square = \square$

$7 \times 8 = 6 \times 8 + 8$

$= \square + 8 = \square$

$8 \times 8 = 7 \times 8 + 8$

$= \square + 8 = \square$

$9 \times 8 = 8 \times 8 + 8$

$= \square + 8 = \square$

$10 \times 8 = 9 \times 8 + 8$

$= \square + 8 = \square$

Count by eights.

| | | | | |
|---|---|---|---|---|
| 8 | 16 | | | |
| | | | | |

| | | | |
|---|---|---|---|
| 32 | 48 | 16 | 56 |
| + 8 | + 8 | + 8 | + 8 |
| | | | |
| 64 | 24 | 80 | 72 |
| + 8 | + 8 | + 8 | + 8 |
| | | | |

Count backwards by eights.

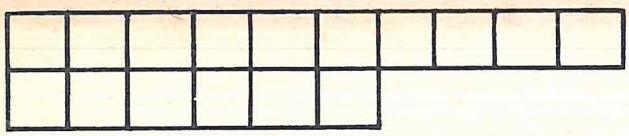
| | | | | |
|---|---|---|---|---|
| 80 | | | | |
| | | | | |

| | |
|---|---|
| $1 \times 8 = \square$ | $6 \times 8 = \square$ |
| $2 \times 8 = \square$ | $7 \times 8 = \square$ |
| $3 \times 8 = \square$ | $8 \times 8 = \square$ |
| $4 \times 8 = \square$ | $9 \times 8 = \square$ |
| $5 \times 8 = \square$ | $10 \times 8 = \square$ |

| | |
|---|---|
| $\square \times 8 = 40$ | $\square \times 8 = 24$ |
| $\square \times 8 = 64$ | $\square \times 8 = 8$ |
| $\square \times 8 = 16$ | $\square \times 8 = 48$ |
| $\square \times 8 = 56$ | $\square \times 8 = 72$ |
| $\square \times 8 = 80$ | $\square \times 8 = 32$ |

The baker filled 4 boxes, with 8 cupcakes in each box. The number of cakes in the 4 boxes is $\square$.

# Dividing by Eight

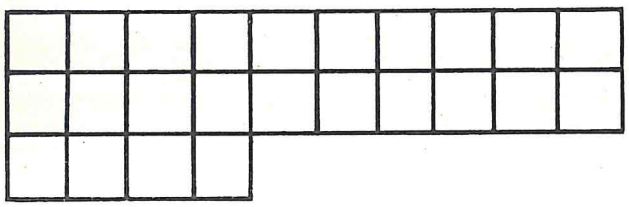


There are 16 boxes here.
Color the first eight boxes red.
Color the next eight boxes blue.

There are ☐ eights in 16.

$16 \div 8 =$ ☐

$8\overline{)16}$ ☐

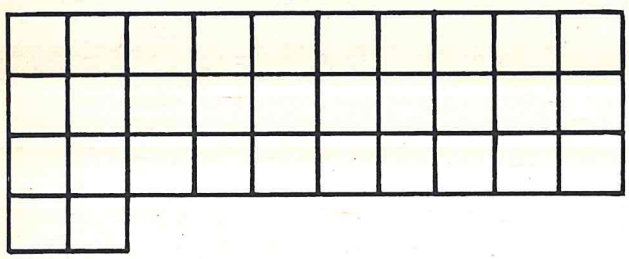


There are 24 boxes here.
Color the first eight boxes red.
Color the next eight boxes blue.
Color the next eight boxes red.

There are ☐ eights in 24.

$24 \div 8 =$ ☐

$8\overline{)24}$ ☐



There are 32 boxes here. Color the boxes in groups of eight. Color the first group red, the second group blue, the third group red, and so on.

There are ☐ eights in 32.

$32 \div 8 =$ ☐

$8\overline{)32}$ ☐

How many eights are there in 40?
To find out, take away eights until none are left.

$40 - 8 = 32$ → $32 - 8 = 24$ → $24 - 8 = 16$ → $16 - 8 = 8$ → $8 - 8 = 0$

Count the eights taken away.

There are ☐ eights in 40.

$40 \div 8 =$ ☐

$8\overline{)40}$ ☐

How many eights can you take away from 48?

$48 - 8 =$ ☐ → ☐ $- 8 =$ ☐ → ☐ $- 8 =$ ☐ → ☐ $- 8 =$ ☐

Continue taking away eights until you get 0.

There are ☐ eights in 48.

$48 \div 8 =$ ☐

$8\overline{)48}$ ☐

$7 \times 8 =$ ☐ ☐ $\div 8 = 7$

$8 \times 8 =$ ☐ ☐ $\div 8 = 8$

$9 \times 8 =$ ☐ ☐ $\div 8 = 9$

$10 \times 8 =$ ☐ ☐ $\div 8 = 10$

| | | | |
|---|---|---|---|
| 5 0 | 6 0 | 7 0 | 8 0 |
| + 5 0 | + 6 0 | + 7 0 | + 8 0 |
| ☐☐☐ | ☐☐☐ | ☐☐☐ | ☐☐☐ |

# Dividing Large Numbers

Problem: A fruit dealer has 48 lemons to pack in boxes. He puts 3 lemons into each box. How many boxes does he fill? You have to find out how many 3's there are in 48.

**Step I.** (Trying tens)
10 X 3 = 30 (less than 48)
20 X 3 = 60 (more than 48)

**Step II.** (Estimate)
He fills more than 10 boxes, but less than 20 boxes.

**Step III.** Write the 10 here.

```
  1 0
3|4 8
```

**Step IV.** 10 X 3 = 30
Ten boxes use up 30 lemons.
Write the 30 here.

```
  1 0
3|4 8
  3 0
```

**Step V.** 48 − 30 = 18
There are 18 more lemons to be put in boxes.
Write the 18 here.

```
  1 0
3|4 8
  3 0
  ---
  1 8
```

**Step VI.** How many threes are there in 18? There are 6.
Write 6 here.

```
    6
  1 0
3|4 8
  3 0
  ---
  1 8
  1 8
  ---
```

6 boxes use up 18 lemons.
Write 18 here.

**Step VII.** 18 − 18 = 0
All the lemons are used up.

**Step VIII.** 10 + 6 = 16
He used 16 boxes.

---

How many threes are there in 96?

10 X 3 = 30 (less than 96)
20 X 3 = 60 (less than 96)
30 X 3 = 90 (less than 96)
40 X 3 = 120 (more than 96)

Estimate:
more than 30

□□ + □ = Answer: □□

□□ = estimate
3|96
□□ = estimate X 3
96 − □□ = □
□ = □ threes

How many twos are there in 72?

10 X 2 = ☐☐

20 X 2 = ☐☐

30 X 2 = ☐☐

40 X 2 = ☐☐

Estimate:

more than ☐☐

☐☐ + ☐

☐☐ = estimate

2 ⟌ 72

☐☐ = estimate X 2

72 − ☐☐ = ☐☐

☐☐ = ☐ twos

Answer:

= ☐☐

How many fours are there in 92?

10 X 4 = ☐☐

20 X 4 = ☐☐

30 X 4 = ☐☐☐

Estimate:

more than ☐☐

☐☐ + ☐

☐☐ = estimate

4 ⟌ 92

☐☐ = estimate X 4

92 − ☐☐ = ☐☐

☐☐ = ☐ fours

Answer:

= ☐☐

How many fives are there in 60?

10 X 5 = ☐☐

20 X 5 = ☐☐☐

Estimate:

more than ☐☐

☐☐ + ☐

☐☐ = estimate

5 ⟌ 60

☐☐ = estimate X 5

60 − ☐☐ = ☐☐

☐☐ = ☐ fives

Answer:

= ☐☐

# Mixed Numbers



$1\frac{1}{2}$ means 1 and 1 half.

$2\frac{1}{4}$ means 2 and 1 fourth.

$3\frac{1}{8}$ means ☐ and ☐ eighth.

$1\frac{1}{4}$ means ☐ and ☐ _____

$2\frac{1}{2}$ means ☐ and ☐ _____

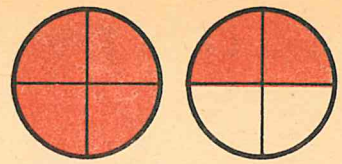
$5\frac{1}{3}$ means ☐ and ☐ _____

$2\frac{2}{3}$ means ☐ and ☐ _____

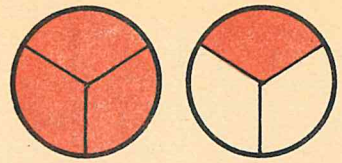
$2\frac{3}{4}$ means ☐ and ☐ _____

$3\frac{5}{8}$ means ☐ and ☐ _____

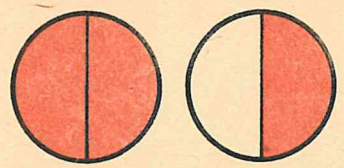
$4\frac{2}{4}$ means ☐ and ☐ _____



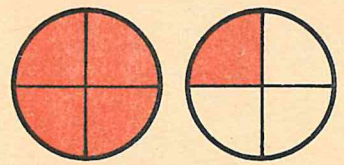
$\frac{6}{4} = 1\frac{2}{4}$



$\frac{4}{3} =$ ☐ ☐/☐



$\frac{3}{2} =$ ☐ ☐/☐



$\frac{5}{4} =$ ☐ ☐/☐

How many twos are there in 56?

10 X 2 = ☐☐

20 X 2 = ☐☐

30 X 2 = ☐☐

Estimate:

more than ☐☐

☐☐ + ☐ = ☐☐ Answer:

☐☐ = estimate

2 ⟌ 56

☐☐ = estimate X 2

56 − ☐☐ = ☐☐

☐☐ = ☐ twos

How many threes are there in 42?

10 X 3 = ☐☐

20 X 3 = ☐☐

Estimate:

more than ☐☐

☐☐ + ☐ = ☐☐ Answer:

☐☐ = estimate

3 ⟌ 42

☐☐ = estimate X 3

42 − ☐☐ = ☐☐

☐☐ = ☐ threes

## Roman Numerals up to Fifty

X = ☐☐

XX = ☐☐ + ☐☐ = ☐☐

XXX = ☐☐ + ☐☐ + ☐☐ = ☐☐

L = 50

XL = 50 − 10 = ☐☐

XV = ☐☐ + 5 = ☐☐

XXV = ☐☐ + 5 = ☐☐

XXXV = ☐☐ + 5 = ☐☐

XLV = ☐☐ + 5 = ☐☐

XXIX = ☐☐ + 9 = ☐☐

XXI = ☐☐

XXIV = ☐☐

XXVI = ☐☐

XLIX = ☐☐

XXXII = ☐☐

XXXVI = ☐☐

XL = ☐☐

XXIX = ☐☐

XLI = ☐☐

XLII = ☐☐

XVIII = ☐☐

XXXIX = ☐☐

XXXIV = ☐☐

XLVI = ☐☐

XXVII = ☐☐

XLVIII = ☐☐

XLIV = ☐☐

XXXVII = ☐☐

XXXIII = ☐☐

XLVII = ☐☐

XXV = ☐☐

XXXI = ☐☐

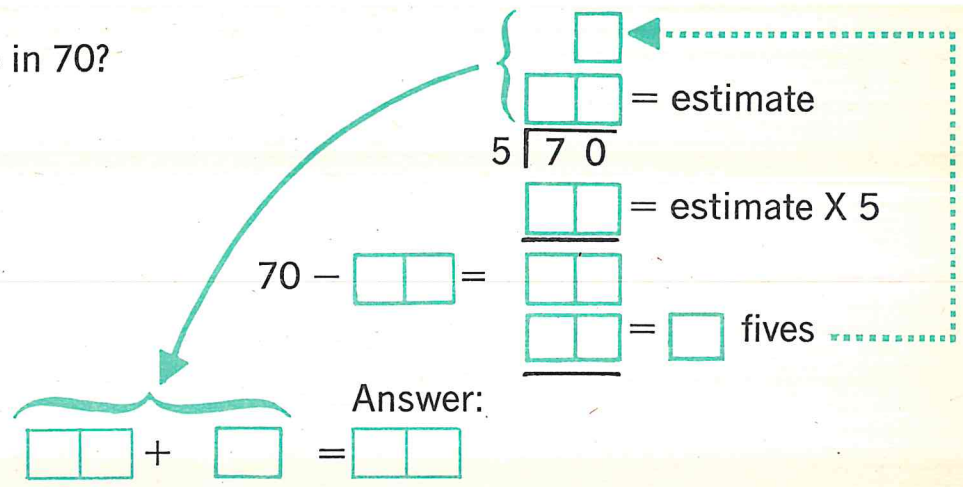
How many fives are there in 70?

10 X 5 = ☐☐

20 X 5 = ☐☐☐

Estimate:

more than ☐☐




How many fours are there in 92?

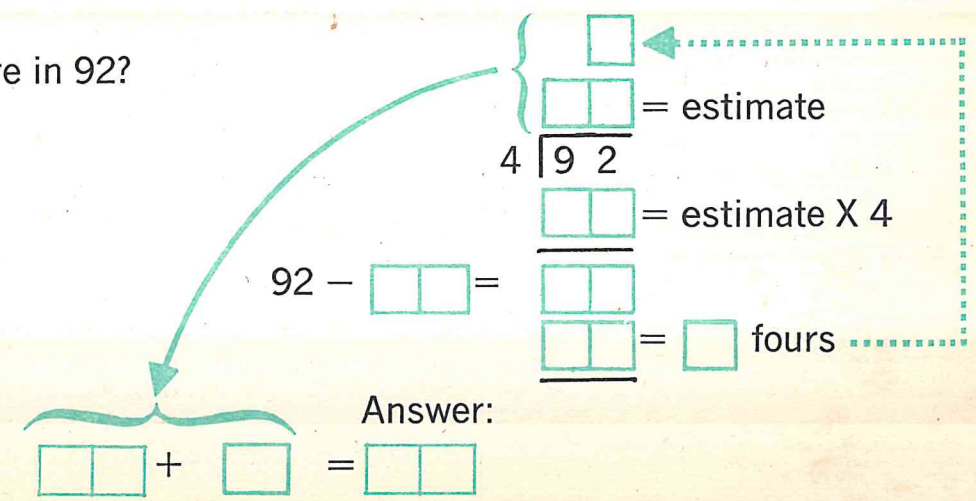
10 X 4 = ☐☐

20 X 4 = ☐☐

30 X 4 = ☐☐☐

Estimate:

more than ☐☐



# Column Addition with Three-Digit Numbers



Write in vertical form and add.

216 + 45 + 61 + 117

```
  1 1
  2 1 6
    4 5
    6 1
+ 1 1 7
-------
  4 3 9
```

6 + 5 + 1 + 7 = 19
= 1 ten + 9

(1 + 1 + 4 + 6 + 1) tens
= 13 tens
= 1 hundred + 3 tens

(1 + 2 + 1) hundreds
= 4 hundreds

Write in vertical form and add.

$3.25 + $1.75 + $.64

381 + 78 + 242

Add.

```
  1 4 6        2 4 5
    8 1        1 6 1
    4 3          5 7
+ 1 5 0      + 2 1 8
---------    ---------
```

$5.29 + $2.89 + $.15

How many twos are there in 68?

10 X 2 = ☐☐
20 X 2 = ☐☐
30 X 2 = ☐☐
40 X 2 = ☐☐

Estimate:

more than ☐☐

☐☐ = estimate

2 ⟌6 8

☐☐ = estimate X 2

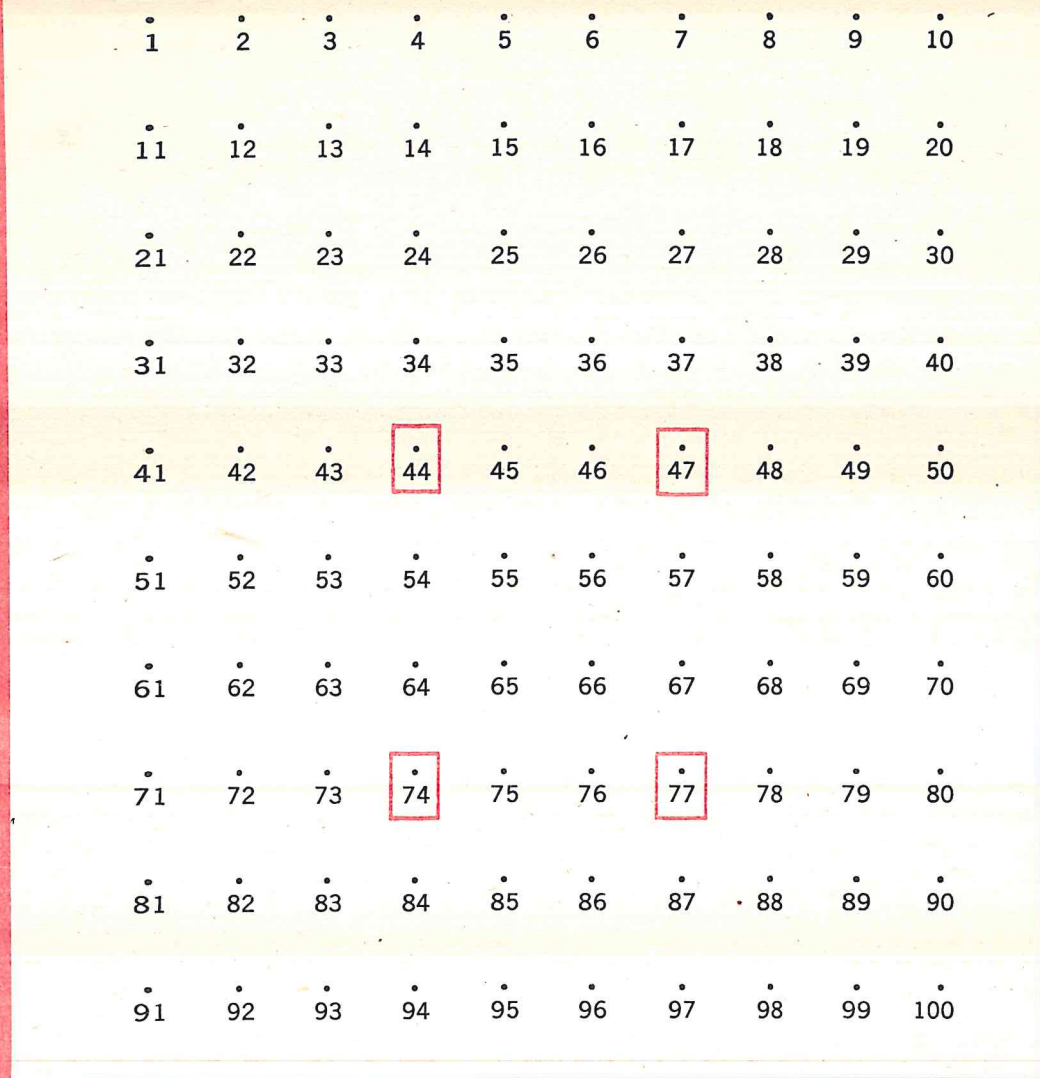
68 − ☐☐ = ☐

☐ = ☐ twos

☐☐ + ☐ = ☐☐

Answer:

# Finding the Hidden Picture




These dots are numbered from 1 to 100. If you join some of these dots in the right order, you will find a hidden picture. To find out which dots you should join, do the following exercises. The answer to exercise (a) is the number of a dot.

Put your pencil on this dot. Then draw a line to the dot whose number is the answer to exercise (b).

Do exercise (c), exercise (d), and so on to find the other dots that you must join to make the picture.

a. $18 + 15 =$
b. $27 + 26 =$
c. $9 \times 7 =$
d. $77 + 6 =$
e. $90 - 6 =$
f. $97 - 12 =$
g. $5 \times 13 =$
h. $6 \times 11 =$
i. $99 - 13 =$
j. $58 + 29 =$
k. $4 \times 22 =$
l. $4 \times 17 =$
m. $49 + 9 =$
n. $50 - 12 =$
o. $8 \times 2 =$
p. $30 \div 5 =$
q. $20 \div 4 =$
r. $5 \times 3 =$
s. $3 \times 8 =$
t. $3 \times 11 =$
u. $5 \times 7 =$
v. $6 \times 6 =$
w. $72 - 35 =$
x. $24 + 14 =$

# Subtracting Three-Digit Numbers with One Exchange

Subtract 342 − 126. Estimate: about 300 − 100 = 200

342 = 3 hundreds and 4 tens and 2 ones

126 = 1 hundred and 2 tens and 6 ones

There are not enough ones in 2 ones for us to take away 6.

Take 1 ten from 4 tens and exchange it for 10 ones.

342 = 3 hundreds and 3 tens and 12 ones

126 = 1 hundred and 2 tens and 6 ones

342 − 126 = ☐ hundreds and ☐ ten and ☐ ones

= ☐☐☐

**Short Way**

| Hundreds | Tens | Ones |
|---|---|---|
| | 3 | 12 |
| 3 | 4 | 2 |
| − 1 | 2 | 6 |
| ☐ | ☐ | ☐ |

Subtract 581 − 153. Estimate: about 600 − 200 = ☐☐☐

581 = 5 hundreds + 8 tens + 1 one

153 = 1 hundred + 5 tens + 3 ones

Exchange 1 ten for 10 ones.

581 = 5 hundreds + ☐ tens + ☐☐ ones

153 = 1 hundred + 5 tens + 3 ones

581 − 153 = ☐ hundreds + ☐ tens + ☐ ones

= ☐☐☐

**Short Way**

| | | |
|---|---|---|
| ☐ | ☐ | ☐☐ |
| 5 | 8 | 1 |
| − 1 | 5 | 3 |
| ☐ | ☐ | ☐ |

Subtract in the short way.

| | | | |
|---|---|---|---|
| ☐ ☐☐<br>4 5 5<br>− 1 1 8<br>☐☐☐ | ☐ ☐☐<br>5 8 2<br>− 1 0 9<br>☐☐☐ | ☐ ☐☐<br>4 5 3<br>− 1 1 6<br>☐☐☐ | ☐ ☐☐<br>3 5 4<br>− 1 0 8<br>☐☐☐ |
| ☐ ☐☐<br>4 9 3<br>− 2 4 7<br>☐☐☐ | ☐ ☐☐<br>7 9 4<br>− 1 1 5<br>☐☐☐ | ☐ ☐☐<br>5 9 0<br>− 2 2 7<br>☐☐☐ | ☐ ☐☐<br>6 8 0<br>− 1 3 5<br>☐☐☐ |

Subtract in the short way.

| | | | |
|---|---|---|---|
| 4 8 0<br>− 1 1 6<br>□□□ | 5 7 3<br>− 1 2 5<br>□□□ | 6 4 2<br>− 2 0 5<br>□□□ | 8 9 1<br>− 3 2 7<br>□□□ |
| 5 6 8<br>− 4 9<br>□□□ | 6 7 2<br>− 2 4<br>□□□ | 4 5 1<br>− 1 2 6<br>□□□ | 3 8 2<br>− 1 6 7<br>□□□ |
| 2 8 5<br>− 1 5 9<br>□□□ | 3 4 7<br>− 2 1 8<br>□□□ | 5 5 7<br>− 1 1 9<br>□□□ | 4 8 4<br>− 1 2 7<br>□□□ |

How many fours are there in 52?

10 X 4 = □□

20 X 4 = □□

Estimate:

more than □□

□ = estimate

□□ = estimate X 4

52 − □□ = □□

□□ = □ fours

Answer:

□□ + □ = □□

How many fives are there in 75?

10 X 5 = □□

20 X 5 = □□□

Estimate:

more than □□

□ = estimate

□□ = estimate X 5

75 − □□ = □□

□□ = □ fives

Answer:

□□ + □ = □□

Subtract 415 − 192. Estimate: about 400 − 200 = ☐☐☐

415 = 4 hundreds and 1 ten and 5 ones

192 = 1 hundred and 9 tens and 2 ones

There are not enough tens in 1 ten for us to take away 9 tens. Take 1 hundred from 4 hundreds and exchange it for 10 tens.

415 = 3 hundreds and 11 tens and 5 ones

192 = 1 hundred and 9 tens and 2 ones

415 − 192 = ☐ hundreds and ☐ tens and ☐ ones

= ☐☐☐

**Short Way**

| | Hundreds | Tens | Ones |
|---|---|---|---|
| | 3 | 11 | |
| | ~~4~~ | ~~1~~ | 5 |
| − | 1 | 9 | 2 |
| | ☐ | ☐ | ☐ |

Subtract 628 − 273. Estimate: about 600 − 300 = ☐☐☐

628 = 6 hundreds and 2 tens and 8 ones

273 = 2 hundreds and 7 tens and 3 ones

Exchange 1 hundred for 10 tens.

628 = 5 hundreds and 12 tens and 8 ones

273 = 2 hundreds and 7 tens and 3 ones

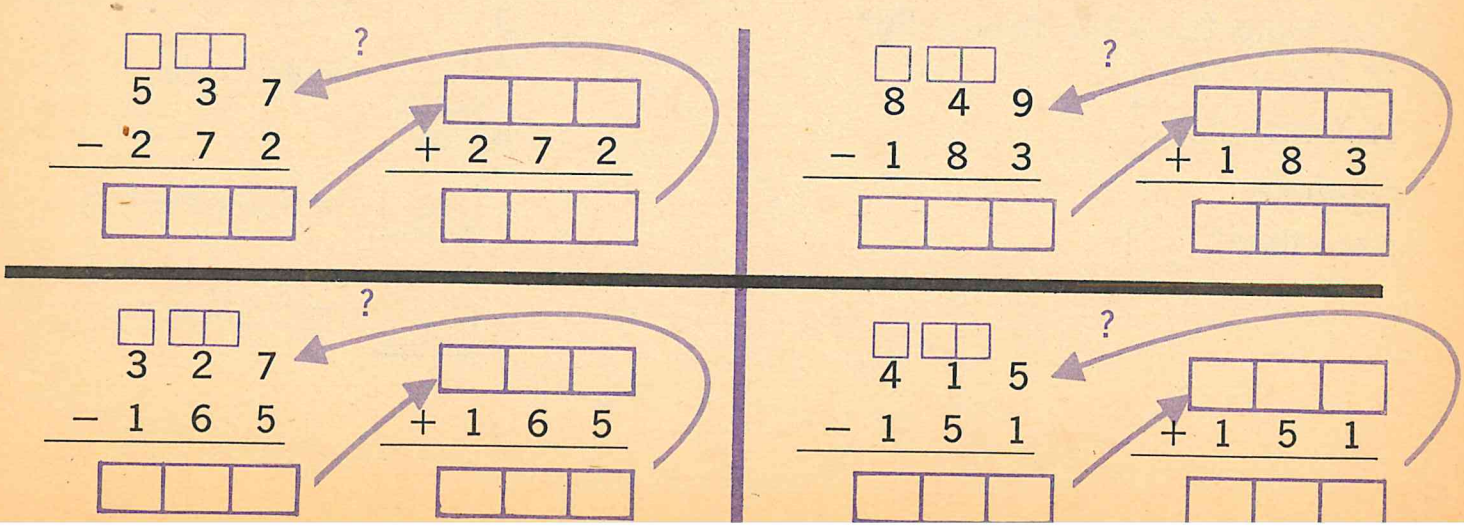
628 − 273 = ☐ hundreds and ☐ tens and ☐ ones

= ☐☐☐

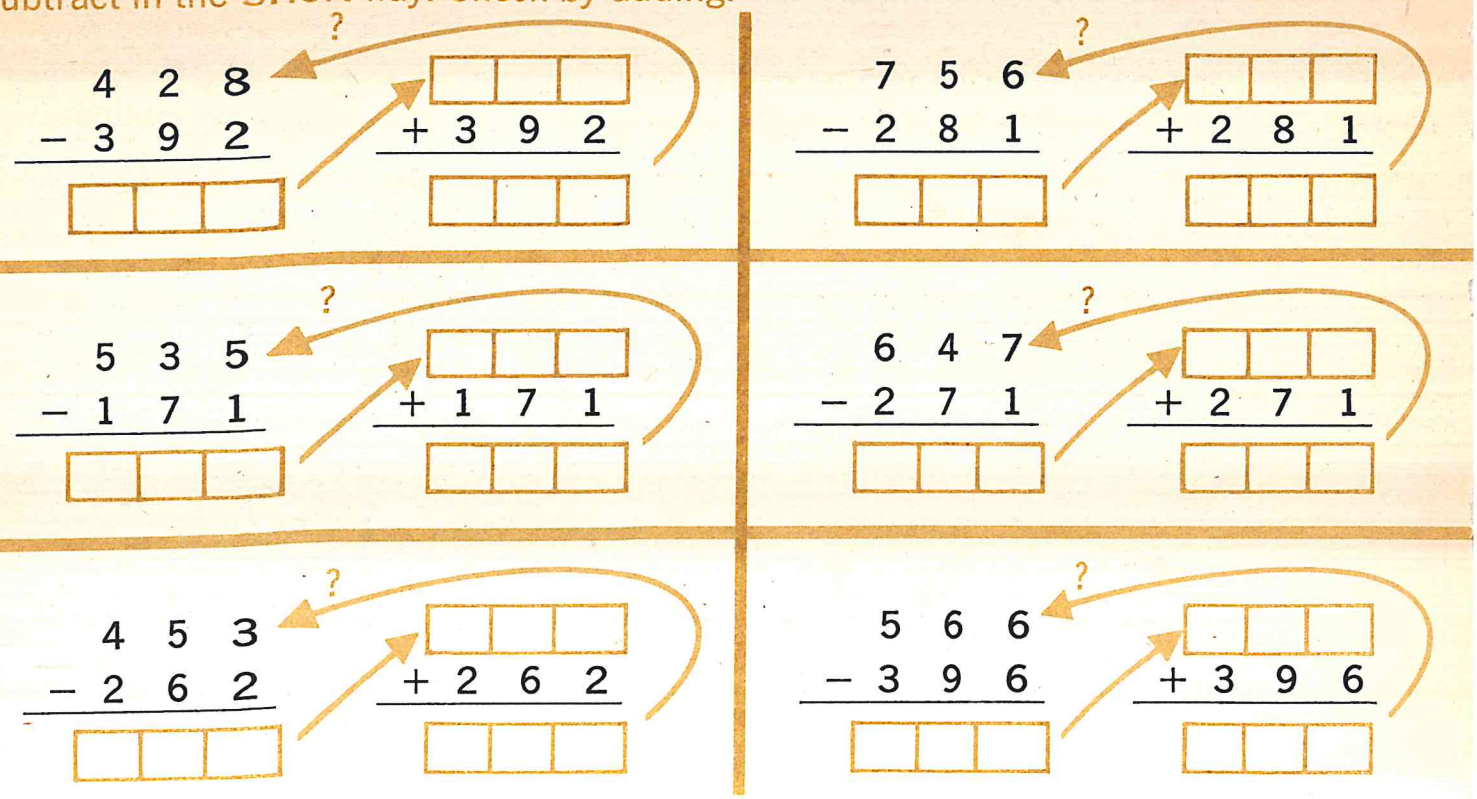
**Short Way**

| | | | |
|---|---|---|---|
| | 5 | 12 | |
| | ~~6~~ | ~~2~~ | 8 |
| − | 2 | 7 | 3 |
| | ☐ | ☐ | ☐ |

Subtract in the short way. Check by adding.



Subtract in the short way. Check by adding.



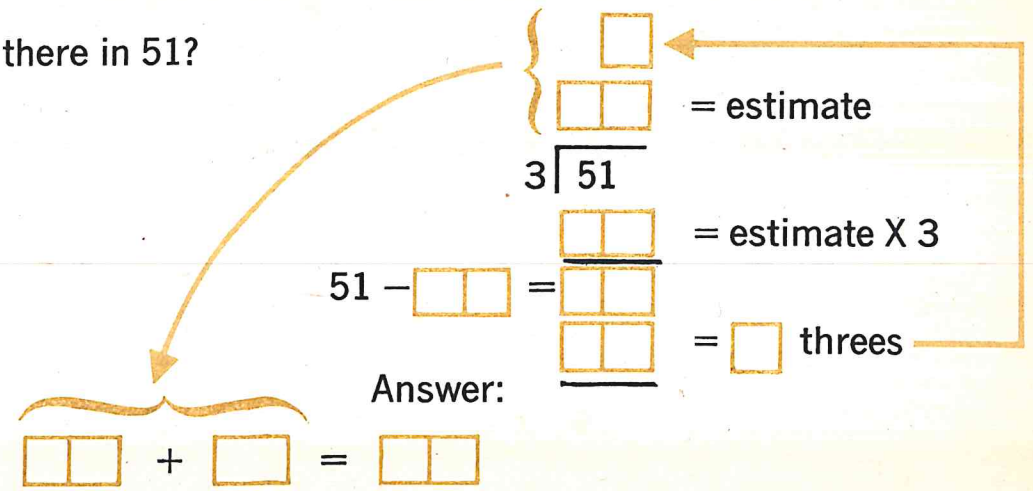

How many threes are there in 51?

10 X 3 = ☐☐

20 X 3 = ☐☐

Estimate:

more than ☐☐



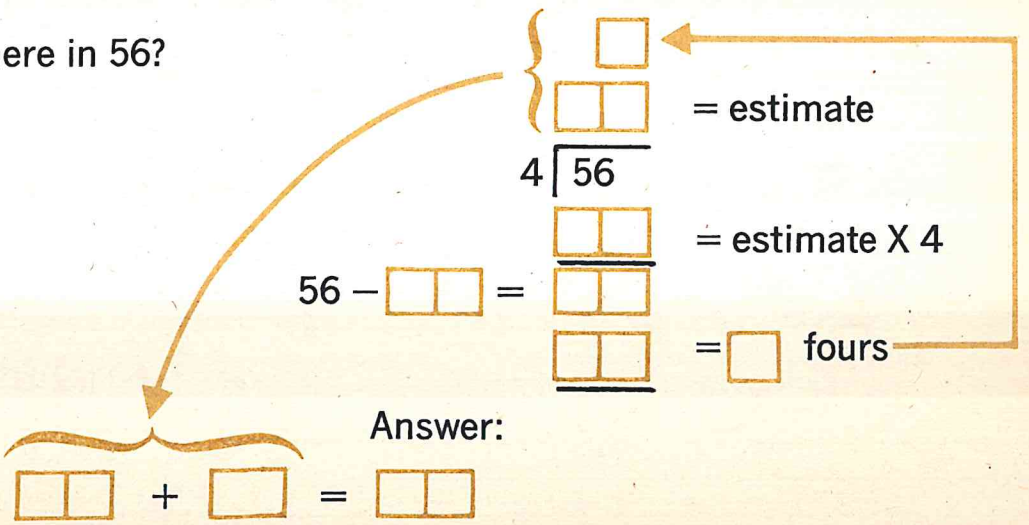

How many fours are there in 56?

10 X 4 = ☐☐

20 X 4 = ☐☐

Estimate:

more than ☐☐



# Dividing by Eight with a Remainder

Count by eights up to 48, and circle the numbers that are less than 35.

8 16 24 32 40 48

$4 \times 8 = 32$ $35 - 32 = 3$

4 and 3 left

$8\overline{)35}$

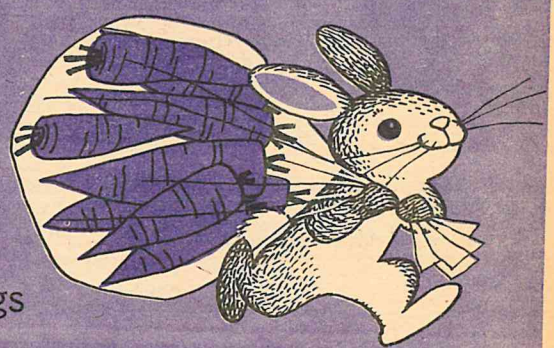
There were 43 people at a square dance. They formed square sets for the dance, with 8 people in each set. There were ☐ sets, and ☐ people were left.

Count by eights up to 48, and circle the numbers that are less than 42.

☐ ☐ ☐ ☐ ☐ ☐

☐ and ☐ left

$8\overline{)42}$



Carrots were packed in plastic bags with 8 carrots in each bag. If there were 66 carrots in all, how many bags were packed?

☐ bags were packed.

☐ carrots were left.

☐ and ☐ left

$8\overline{)17}$

☐ and ☐ left

$8\overline{)26}$

☐ and ☐ left

$8\overline{)75}$

☐ and ☐ left

$8\overline{)60}$

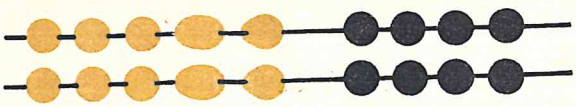
☐ and ☐ left

$8\overline{)37}$

There were 8 boys in a club. One of them found a quarter. They decided to share the money equally. Each boy got ☐ ¢, and there was ☐ ¢ left over.

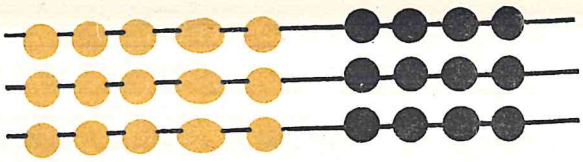
# Nines

$9 = 5 + 4$



$2 \times 9 = 9 + 9$

$= 5 + 5 + 4 + 4 = \square$



$3 \times 9 = 9 + 9 + 9$

$= 5 + 5 + 5 + 4 + 4 + 4$

$= \square$

$4 \times 9 =$ double $2 \times 9$

$= 2 \times \square = \square$

$5 \times 9 = 4 \times 9 + 9$

$= \square + 9 = \square$

$6 \times 9 =$ double $3 \times 9$

$= 2 \times \square = \square$

$7 \times 9 = 6 \times 9 + 9$

$= \square + 9 = \square$

$8 \times 9 = 7 \times 9 + 9$

$= \square + 9 = \square$

$9 \times 9 = 8 \times 9 + 9$

$= \square + 9 = \square$

$10 \times 9 = 9 \times 9 + 9$

$= \square + 9 = \square$

Count by nines.

| | | | | |
|---|---|---|---|---|
| 9 | 18 | | | |
| | | | | |

| | | | |
|---|---|---|---|
| 45 + 9 = | 72 + 9 = | 27 + 9 = | 18 + 9 = |
| | | | |

| | | | |
|---|---|---|---|
| 36 + 9 = | 54 + 9 = | 27 + 9 = | 63 + 9 = |
| | | | |

Count backwards by nines.

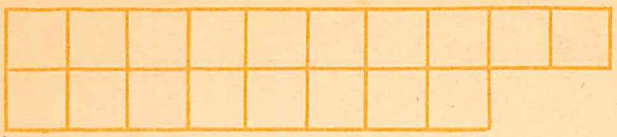
| | | | | |
|---|---|---|---|---|
| 90 | | | | |
| | | | | |

| | |
|---|---|
| $1 \times 9 =$ | $6 \times 9 =$ |
| $2 \times 9 =$ | $7 \times 9 =$ |
| $3 \times 9 =$ | $8 \times 9 =$ |
| $4 \times 9 =$ | $9 \times 9 =$ |
| $5 \times 9 =$ | $10 \times 9 =$ |

| | |
|---|---|
| $\square \times 9 = 18$ | $\square \times 9 = 45$ |
| $\square \times 9 = 63$ | $\square \times 9 = 27$ |
| $\square \times 9 = 36$ | $\square \times 9 = 54$ |
| $\square \times 9 = 90$ | $\square \times 9 = 81$ |
| $\square \times 9 = 72$ | $\square \times 9 = 9$ |

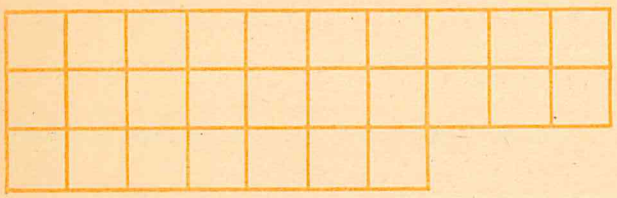
How many boys are needed to form 4 teams with 9 boys on each team?

Answer: ☐



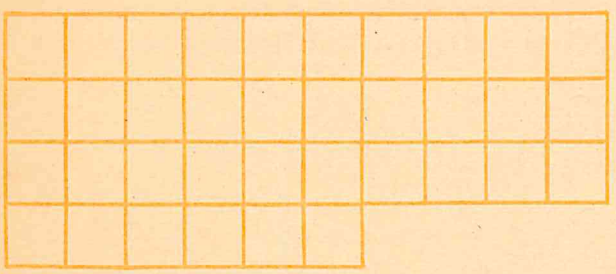
There are 18 boxes here.
Color the first nine boxes red.
Color the next nine boxes blue.
There are ☐ nines in 18.
18 ÷ 9 = ☐

☐
9 ⟌ 18



There are 27 boxes here.
Color the first nine boxes red.
Color the next nine boxes blue.
Color the next nine boxes red.
There are ☐ nines in 27.
27 ÷ 9 = ☐

☐
9 ⟌ 27



There are 36 boxes here. Color the boxes in groups of nine. Color the first group red, the second group blue, the third group red, and so on.
There are ☐ nines in 36.
36 ÷ 9 = ☐

☐
9 ⟌ 36

How many nines are there in 45?
To find out, take away nines until none are left.

| 45 | 36 | 27 | 18 | 9 |
|---|---|---|---|---|
| − 9 | − 9 | − 9 | − 9 | − 9 |
| 36 | 27 | 18 | 9 | 0 |

Count the nines taken away.
There are ☐ nines in 45.
45 ÷ 9 = ☐

☐
9 ⟌ 45

How many nines can you take away from 54?

| 54 | ☐ | ☐ | ☐ |
|---|---|---|---|
| − 9 | − 9 | − 9 | − 9 |
| ☐ | ☐ | ☐ | ☐ |

Continue taking away nines until you get 0.

There are ☐ nines in 54.
54 ÷ 9 = ☐

☐
9 ⟌ 54

| | |
|---|---|
| 7 X 9 = ☐ | ☐ ÷ 9 = 7 |
| 8 X 9 = ☐ | ☐ ÷ 9 = 8 |
| 9 X 9 = ☐ | ☐ ÷ 9 = 9 |
| 10 X 9 = ☐ | ☐ ÷ 9 = 10 |

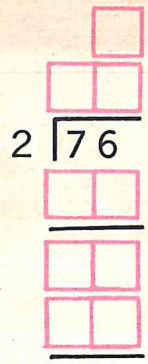
| 40 | 50 | 60 | 70 |
|---|---|---|---|
| 40 | 50 | 60 | 70 |
| + 40 | + 50 | + 60 | + 70 |
| ☐ | ☐ | ☐ | ☐ |

# Practice in Dividing Large Numbers

How many twos are there in 76?

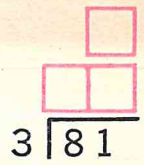
10 X 2 = ☐
20 X 2 = ☐
30 X 2 = ☐
40 X 2 = ☐
50 X 2 = ☐

Estimate:
more than ☐




76 ÷ 2 = ☐

How many threes are there in 81?



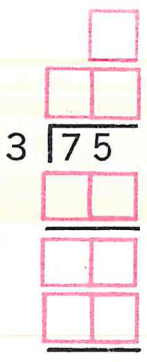

Estimate:
more than ☐

81 ÷ 3 = ☐

How many threes are there in 75?

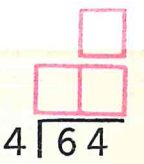
10 X 3 = ☐
20 X 3 = ☐
30 X 3 = ☐
40 X 3 = ☐
50 X 3 = ☐

Estimate:
more than ☐




75 ÷ 3 = ☐

How many fours are there in 64?



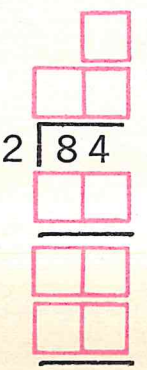

Estimate:
more than ☐

64 ÷ 4 = ☐

How many twos are there in 84?

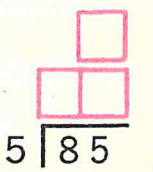
10 X 2 = ☐
20 X 2 = ☐
30 X 2 = ☐
40 X 2 = ☐
50 X 2 = ☐

Estimate:
more than ☐




84 ÷ 2 = ☐

How many fives are there in 85?




Estimate:
more than ☐

85 ÷ 5 = ☐

How many threes are there in 84?

20 X 3 = 60  30 X 3 = 90

Estimate: more than 20

```
   8
  20
3|84
  60
  24
  24
```

20 + 8 = 28

There are ☐ threes in 84.

Estimate: more than ☐

Answer: ☐

2|86

How many twos are there in 94?

40 X 2 = ☐  50 X 2 = ☐

Estimate: more than ☐

☐☐ + ☐ = ☐☐

There are ☐☐ twos in 94.

Estimate: more than ☐

Answer: ☐

5|80

How many fives are there in 90?

10 X 5 = ☐  20 X 5 = ☐

Estimate: more than ☐

☐☐ + ☐ = ☐☐

There are ☐☐ fives in 90.

Estimate: more than ☐

Answer: ☐

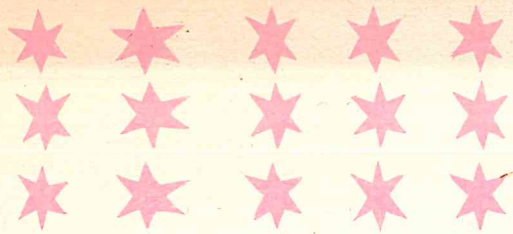
4|68

Estimate: more than ☐

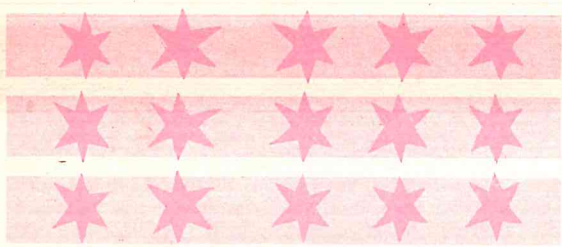
Answer: ☐

3|72

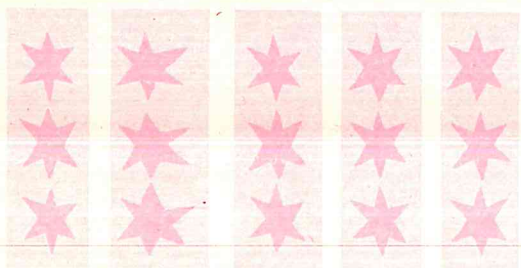
# Changing Places in Multiplying



Here are some stars arranged in rows and columns.
We can group them by rows, like this:



Then we see there are 3 X 5 stars.
We can group them by columns, like this:



Then we see there are 5 X 3 stars.

So $3 \times 5 = 5 \times 3$.

In fact, $3 \times 5 = \square$

and $5 \times 3 = \square$

$4 \times 6 = \square$ $\quad$ $6 \times 4 = \square$

$4 \times 6 = \square \times 4$

$7 \times 8 = \square$ $\quad$ $8 \times 7 = \square$

$7 \times 8 = \square \times 7$

$9 \times 3 = \square$ $\quad$ $3 \times 9 = \square$

$9 \times 3 = \square \times 9$

$7 \times 4 = \square$ $\quad$ $4 \times 7 = \square$

$7 \times 4 = 4 \times \square$

$8 \times 2 = \square$ $\quad$ $2 \times 8 = \square$

$8 \times 2 = 2 \times \square$

$2 \times 10 = \square$ $\quad$ $10 \times 2 = \square$

$2 \times 10 = 10 \times \square$

$3 \times 10 = \square$ $\quad$ $10 \times 3 = \square$

$3 \times 10 = 10 \times \square$

$4 \times 10 = \square$ $\quad$ $10 \times 4 = \square$

$4 \times 10 = 10 \times \square$

If two numbers being multiplied change places, the product is still the same.

| | |
|---|---|
| $1 \times 0 = 0$ | $0 \times 1 = 0$ |
| $2 \times 0 = 0$ | $0 \times 2 = 0$ |
| $3 \times 0 = 0$ | $0 \times 3 = 0$ |
| $4 \times 0 = 0$ | $0 \times 4 = 0$ |
| $5 \times 0 = 0$ | $0 \times 5 = 0$ |
| $6 \times 0 = 0$ | $0 \times 6 = 0$ |

Zero times any number is zero.

| | |
|---|---|
| $0 \times 10 = \square$ | $0 \times 20 = \square$ |
| $0 \times 100 = \square$ | $0 \times 200 = \square$ |
| $0 \times 345 = \square$ | $0 \times 629 = \square$ |

Subtract 623 − 187. Estimate: about 600 − 200 = □□□

623 = 6 hundreds and 2 tens and 3 ones
187 = 1 hundred and 8 tens and 7 ones

There are not enough ones in 3 ones for us to take away 7.
Take 1 ten from 2 tens and exchange it for 10 ones.

623 = 6 hundreds and 1 ten and 13 ones
187 = 1 hundred and 8 tens and 7 ones

There are not enough tens in 1 ten for us to take away 8 tens.
Take 1 hundred from 6 hundreds and exchange it for 10 tens.

623 = 5 hundreds and 11 tens and 13 ones
187 = 1 hundred and 8 tens and 7 ones
623 − 187 = □ hundreds and □ tens and □ ones

= □□□

**Short Way**

$$\begin{array}{r} 6\ 2\ 3 \\ -\ 1\ 8\ 7 \\ \hline \end{array}$$

**Step I.** Exchange 1 ten for 10 ones:

$$\begin{array}{r} \phantom{6}\ 1\ 13 \\ 6\ \not{2}\ \not{3} \\ -\ 1\ 8\ 7 \\ \hline \end{array}$$

**Step II.** Exchange 1 hundred for 10 tens:

$$\begin{array}{r} 5\ 11 \\ \not{6}\ \not{1}\ 13 \\ \not{6}\ \not{2}\ \not{3} \\ -\ 1\ 8\ 7 \\ \hline \square\square\square \end{array}$$

Subtract in the short way. Check by adding.

$$\begin{array}{r} 4\ 3\ 5 \\ -\ 1\ 7\ 9 \\ \hline \square\square\square \end{array} \qquad ? \qquad \begin{array}{r} \square\square\square \\ +\ 1\ 7\ 9 \\ \hline \square\square\square \end{array}$$

$$\begin{array}{r} 8\ 4\ 1 \\ -\ 2\ 4\ 7 \\ \hline \square\square\square \end{array} \qquad ? \qquad \begin{array}{r} \square\square\square \\ +\ 2\ 4\ 7 \\ \hline \square\square\square \end{array}$$

$$\begin{array}{r} 5\ 4\ 8 \\ -\ 2\ 8\ 9 \\ \hline \square\square\square \end{array} \qquad ? \qquad \begin{array}{r} \square\square\square \\ +\ 2\ 8\ 9 \\ \hline \square\square\square \end{array}$$

$$\begin{array}{r} 5\ 5\ 2 \\ -\ 1\ 5\ 6 \\ \hline \square\square\square \end{array} \qquad ? \qquad \begin{array}{r} \square\square\square \\ +\ 1\ 5\ 6 \\ \hline \square\square\square \end{array}$$

Subtract 503 − 128. Estimate: about 500 − 100 = ☐☐☐

503 = 5 hundreds and 0 tens and 3 ones
128 = 1 hundred and 2 tens and 8 ones

There are not enough ones for us to take away 8. So we have to exchange 1 ten for 10 ones. But there are no tens in 503. To get some tens, first exchange 1 hundred for 10 tens:

503 = 4 hundreds and 10 tens and 3 ones

Then exchange 1 ten for 10 ones:

503 = 4 hundreds and 9 tens and 13 ones
128 = 1 hundred and 2 tens and 8 ones
503 − 128 = ☐ hundreds and ☐ tens and ☐ ones

= ☐☐☐

**Short Way**

5 0 3
− 1 2 8

**Step I.** Exchange 1 hundred for 10 tens:

4 10
~~5~~ ~~0~~ 3
− 1 2 8

**Step II.** Exchange 1 ten for 10 ones:

9 13
4 ~~10~~
~~5~~ ~~0~~ ~~3~~
− 1 2 8

☐☐☐

Subtract in the short way. Check by adding.

4 0 5
− 1 5 9
☐☐☐

? + 1 5 9 = ☐☐☐

8 0 7
− 2 3 8
☐☐☐

? + 2 3 8 = ☐☐☐

2 0 6
− 1 9 8
☐☐☐

? + 1 9 8 = ☐☐☐

4 0 4
− 1 8 7
☐☐☐

? + 1 8 7 = ☐☐☐

# Multiplying Three-Digit Numbers with One Exchange

Multiply 2 X 127.
Estimate: about 2 X 100 = □□□

**First Way**

```
  1 2 7
+ 1 2 7
-------
  □□□
```

**Second Way**

```
  1  2  7
  X     2
-------
  □  □  □
```

2 X 7 =
2 X 20 =
2 X 100 =

Multiply 3 X 118.
Estimate: about 3 X 100 = □□□

**First Way**

```
  1 1 8
  1 1 8
+ 1 1 8
-------
  □□□
```

**Second Way**

```
  1  1  8
  X     3
-------
  □  □  □
```

3 X 8 =
3 X 10 =
3 X 100 =

Multiply 4 X 215.
Estimate: about 4 X 200 = □□□

**First Way**

```
  2 1 5
  2 1 5
  2 1 5
+ 2 1 5
-------
  □□□
```

**Second Way**

```
  2  1  5
  X     4
-------
  □  □  □
```

4 X 5 =
4 X 10 =
4 X 200 =

Multiply 3 X 126.
Estimate: about 3 X 100 = □□□

**First Way**

```
  1 2 6
  1 2 6
+ 1 2 6
-------
  □□□
```

**Second Way**

```
  1  2  6
  X     3
-------
  □  □  □
```

3 X 6 =
3 X 20 =
3 X 100 =

Multiply 5 X 116. Estimate: about 5 X 100 = □□□

**Second Way**

```
  1  1  6
  X     5
-------
  □  □  □
```

5 X 6 =
5 X 10 =
5 X 100 =

**Short Way**

Think: 5 X 6 = 30 = 3 tens and 0 ones.
Write the 0 in the ones place.

Think: 5 X 1 ten = 5 tens.
5 tens and 3 tens = 8 tens.

Write the 8 in the tens place.
5 X 1 hundred = 5 hundreds.

```
  1  1  6
  X     5
-------
  5  8  0
```

Multiply in the short way.

| | | | | | |
|---|---|---|---|---|---|
| 1 1 7 | 2 1 8 | 1 1 9 | 2 1 3 | 1 1 2 | 1 1 4 |
| X 3 | X 3 | X 2 | X 4 | X 6 | X 5 |

# Times a Number of Tens

| | | | |
|---|---|---|---|
| 100 + 20 = ☐ | 140 + 20 = ☐ | 160 + 20 = ☐ | 120 + 20 = ☐ |
| 90 + 30 = ☐ | 150 + 30 = ☐ | 180 + 30 = ☐ | 120 + 30 = ☐ |
| 80 + 40 = ☐ | 160 + 40 = ☐ | 200 + 40 = ☐ | 120 + 40 = ☐ |

Count by 20's.

| | | | | |
|---|---|---|---|---|
| 20 | 40 | ☐ | ☐ | ☐ |
| ☐ | ☐ | ☐ | ☐ | ☐ |

Count by 30's.

| | | | | |
|---|---|---|---|---|
| 30 | 60 | ☐ | ☐ | ☐ |
| ☐ | ☐ | ☐ | ☐ | ☐ |

Count by 40's.

| | | | | |
|---|---|---|---|---|
| 40 | 80 | ☐ | ☐ | ☐ |
| ☐ | ☐ | ☐ | ☐ | ☐ |

Count by 50's.

| | | | | |
|---|---|---|---|---|
| 50 | 100 | ☐ | ☐ | ☐ |
| ☐ | ☐ | ☐ | ☐ | ☐ |

| | | |
|---|---|---|
| 3 X 40<br>40<br>40<br>+ 40<br>☐ | 3 X 50<br>50<br>50<br>+ 50<br>☐ | 3 X 60<br>60<br>60<br>+ 60<br>☐ |
| 3 X 70<br>70<br>70<br>+ 70<br>☐ | 3 X 80<br>80<br>80<br>+ 80<br>☐ | 3 X 90<br>90<br>90<br>+ 90<br>☐ |
| 4 X 30<br>30<br>30<br>30<br>+ 30<br>☐ | 4 X 40<br>40<br>40<br>40<br>+ 40<br>☐ | 4 X 50<br>50<br>50<br>50<br>+ 50<br>☐ |
| 2 X 60<br>60<br>+ 60<br>☐ | 2 X 70<br>70<br>+ 70<br>☐ | 2 X 80<br>80<br>+ 80<br>☐ |

10 tens = 1 hundred
20 tens = 2 hundreds
30 tens = ☐ hundreds
40 tens = ☐ hundreds
50 tens = ☐ hundreds
60 tens = ☐ hundreds
70 tens = ☐ hundreds

3 X 70 = 3 X 7 tens = 21 tens
= 20 tens + 1 ten
= 2 hundreds + 1 ten = 210

3 X 50 = 3 X 5 tens = 15 tens
= ☐ tens + 5 tens
= ☐ hundred + 5 tens = ☐

4 X 80 = 4 X 8 tens = 32 tens
= ☐ tens + 2 tens
= ☐ hundreds + 2 tens = ☐

Multiply 2 X 182.

Estimate:
about 2 X 200
= ☐

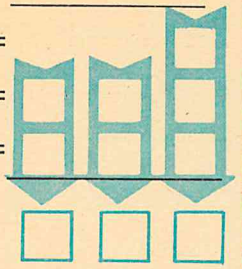
**First Way**

1 8 2
+ 1 8 2
☐

**Second Way**

1 8 2
X 2

2 X 2 =
2 X 80 =
2 X 100 =



☐ ☐ ☐

Multiply 3 X 261.

Estimate:
about 3 X 300
= ☐

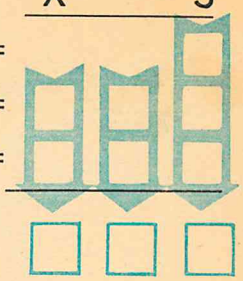
**First Way**

2 6 1
2 6 1
+ 2 6 1
☐

**Second Way**

2 6 1
X 3

3 X 1 =
3 X 60 =
3 X 200 =



☐ ☐ ☐

Multiply 4 X 150.

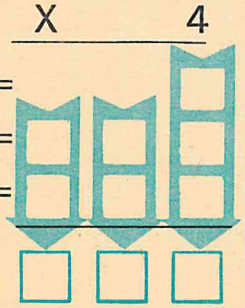
**First Way**

1 5 0
1 5 0
1 5 0
+ 1 5 0
☐

**Second Way**

1 5 0
X 4

4 X 0 =
4 X 50 =
4 X 100 =



☐ ☐ ☐

Multiply 5 X 141.

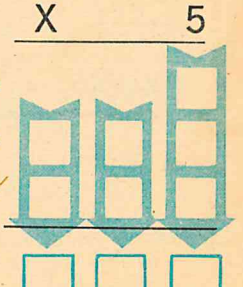
**First Way**

1 4 1
1 4 1
1 4 1
1 4 1
+ 1 4 1
☐

**Second Way**

1 4 1
X 5

5 X 1 =
5 X 40 =
5 X 100 =



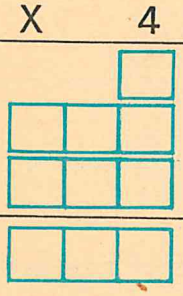
☐ ☐ ☐

Multiply 4 X 231. Estimate: about 4 X 200 = ☐

**Second Way**

2 3 1
X 4

4 X 1 =
4 X 30 =
4 X 200 =



**Short Way**

Think: 4 X 1 = 4. Write the 4 in the ones place.
Think: 4 X 3 tens = 12 tens
= 1 hundred and 2 tens.
Write the 2 in the tens place.
4 X 2 hundreds = 8 hundreds.
8 hundreds and 1 hundred = 9 hundreds

2 3 1
X 4
9 2 4

Multiply in the short way.

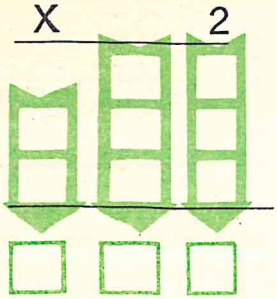
| | | | | | |
|---|---|---|---|---|---|
| 1 5 2 | 1 7 1 | 1 3 1 | 2 8 2 | 1 9 1 | 2 7 2 |
| X 3 | X 4 | X 5 | X 2 | X 2 | X 2 |

# Multiplying Three-Digit Numbers with Two Exchanges

Find 2 X 186.

1 8 6
X 2

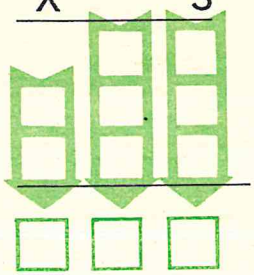
2X6 =
2X80 =
2X100 =



Find 3 X 245.

2 4 5
X 3

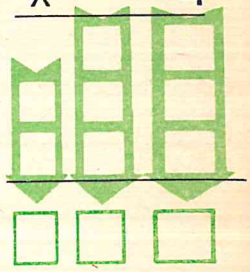
3X5 =
3X40 =
3X200 =



Find 4 X 167.

1 6 7
X 4

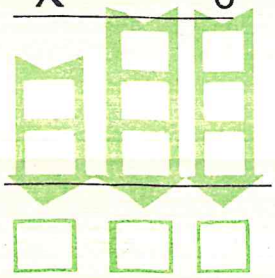
4X7 =
4X60 =
4X100 =



Find 6 X 132.

1 3 2
X 6

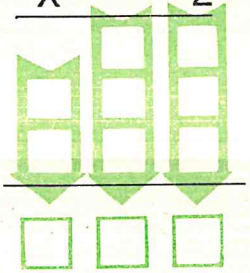
6X2 =
6X30 =
6X100 =



Find 2 X 175.

1 7 5
X 2

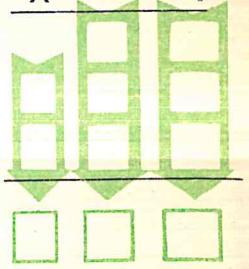
2X5 =
2X70 =
2X100 =



Find 4 X 189.

1 8 9
X 4

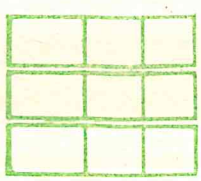
4X9 =
4X80 =
4X100 =



Find 3 X 256.

2 5 6
X 3

3X6 =
3X50 =
3X200 =



Estimate: about 3 X 300 = ☐

**Short Way**

3 X 6 = 18 = 1 ten and 8

Write the 8 in the ones place.

3 X 5 tens = 15 tens

15 tens and 1 ten = 16 tens

= 1 hundred and 6 tens

Write the 6 in the tens place.

3 X 2 hundreds = 6 hundreds

6 hundreds and 1 hundred = 7 hundreds

2 5 6
X 3
7 6 8

Multiply in the short way.

| | | | | | |
|---|---|---|---|---|---|
| 1 5 5 | 2 9 6 | 1 8 5 | 2 3 4 | 1 2 2 | 1 3 4 |
| X 2 | X 2 | X 3 | X 4 | X 5 | X 6 |

# Dividing by Nine with a Remainder



Count by nines up to 54, and circle the numbers that are less than 20.

| 9 | 18 | 27 | 36 | 45 | 54 |
|---|---|---|---|---|---|

$2 \times 9 = 18$ $\quad\quad$ $20 - 18 = 2$

2 and 2 left

$9\overline{)20}$

Count by nines up to 54, and circle the numbers that are less than 32.

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |

$\square$ and $\square$ left

$9\overline{)32}$

$\square$ and $\square$ left

$9\overline{)39}$

$\square$ and $\square$ left

$9\overline{)46}$

$\square$ and $\square$ left

$9\overline{)29}$

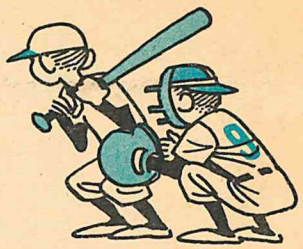
$\square$ and $\square$ left

$9\overline{)60}$

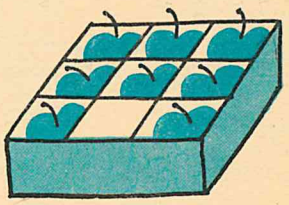
$\square$ and $\square$ left

$9\overline{)43}$

There were 32 boys in a class. 9 boys are needed for a baseball team. There were enough boys in the class for $\square$ teams with $\square$ boys left over.



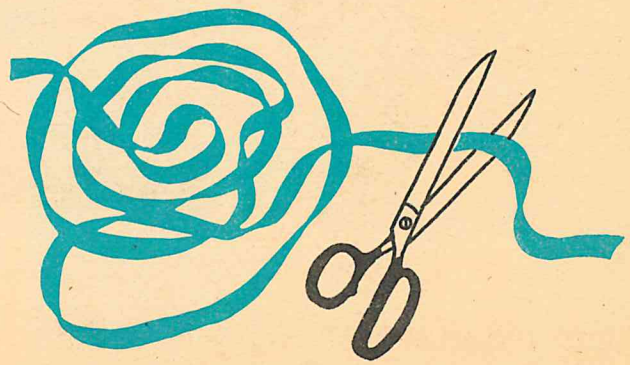
Apples were packed in boxes with 9 apples in each box. If there were 65 apples in all, how many boxes were packed?



Answer: $\square$ apples were left.

$\square$ boxes were packed.

How many 9-inch pieces can be cut from a 75- inch length of ribbon?



Answer: $\square$ pieces, with

$\square$ inches of ribbon left.

# Practice in Dividing with a Remainder

How many sixes are there in 75?

10 X 6 = 60  20 X 6 = 120

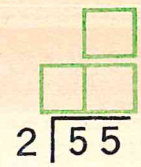
Estimate: more than 10

```
      2
     10
  6 | 75
10 X 6 = 60
     15
 2 X 6 = 12
      3
```

Answer: 12 and 3 left

Estimate:

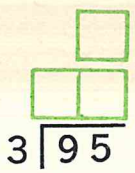
more than ☐



Answer: ☐ and ☐ left

Estimate:

more than ☐

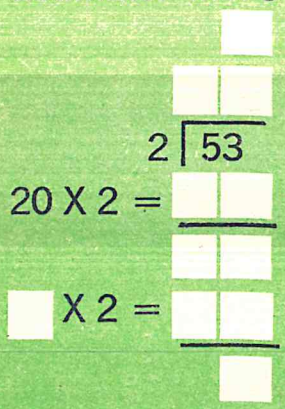


Answer: ☐ and ☐ left

How many twos are there in 53?

20 X 2 = 40  30 X 2 = 60

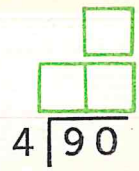
Estimate: more than 20



Answer: ☐ and ☐ left

Estimate:

more than ☐



Answer: ☐ and ☐ left

How many threes are there in 50?

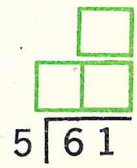
10 X 3 = ☐  20 X 3 = ☐

Estimate: more than ☐

Answer: ☐ and ☐ left

Estimate:

more than ☐



Answer: ☐ and ☐ left

Estimate: more than ☐

$7\overline{)86}$

Answer: ☐ and ☐ left

Estimate: more than ☐

$5\overline{)67}$

Answer: ☐ and ☐ left

Estimate: more than ☐

$2\overline{)69}$

Answer: ☐ and ☐ left

Estimate: more than ☐

$2\overline{)55}$

Answer: ☐ and ☐ left

Estimate: more than ☐

$3\overline{)79}$

Answer: ☐ and ☐ left

Estimate: more than ☐

$3\overline{)98}$

Answer: ☐ and ☐ left

Estimate: more than ☐

$4\overline{)85}$

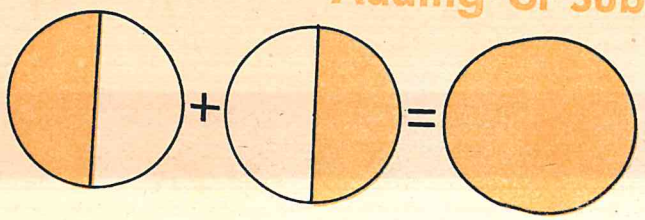
Answer: ☐ and ☐ left

Estimate: more than ☐

$4\overline{)66}$

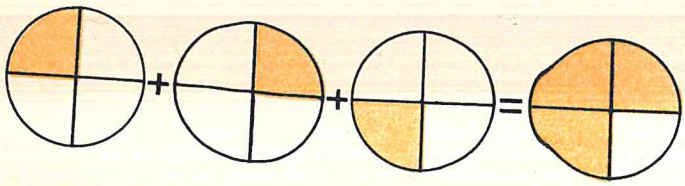
Answer: ☐ and ☐ left

# Adding or Subtracting Fractional Parts

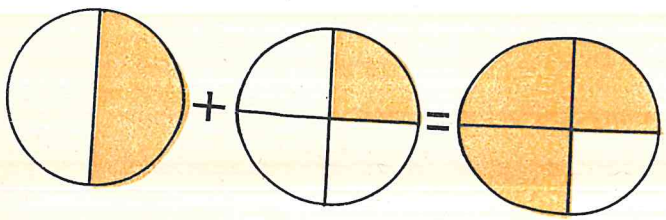


**one half** of a pie + **one half** of a pie = **one whole** pie

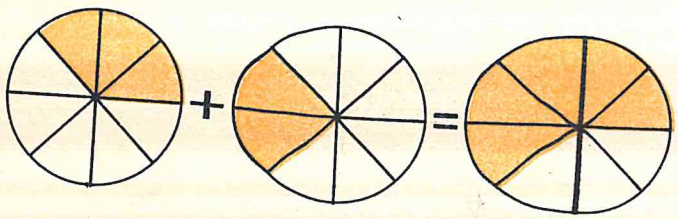
$\frac{1}{2} + \frac{1}{2} = 1$ whole



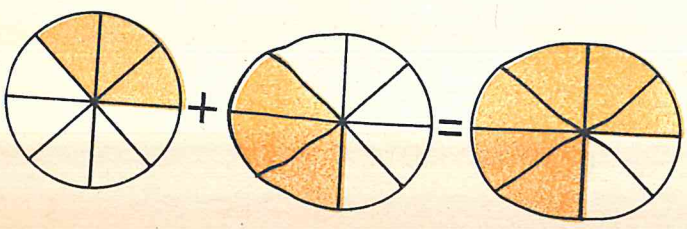
$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{\square}{4}$



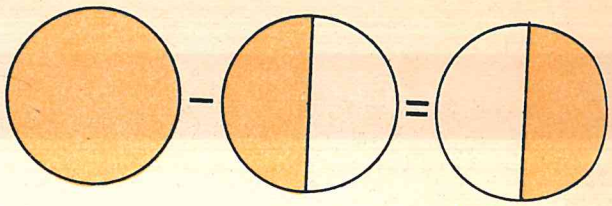
$\frac{1}{2} + \frac{1}{4} = \frac{\square}{4}$



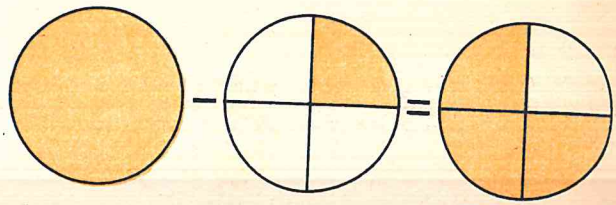
$\frac{3}{8} + \frac{2}{8} = \frac{\square}{8}$



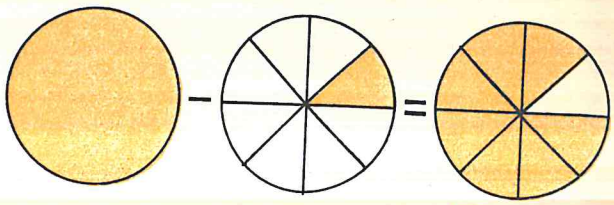
$\frac{3}{8} + \frac{3}{8} = \frac{\square}{8} = \frac{\square}{4}$



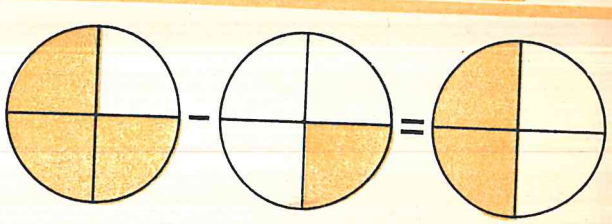
1 whole $- \frac{1}{2} = \frac{\square}{\square}$



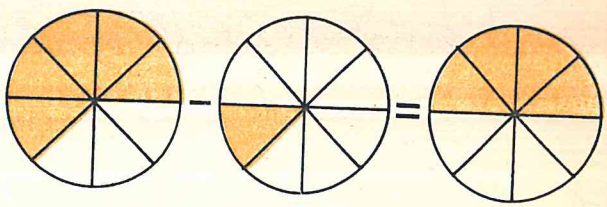
1 whole $- \frac{1}{4} = \frac{\square}{4}$



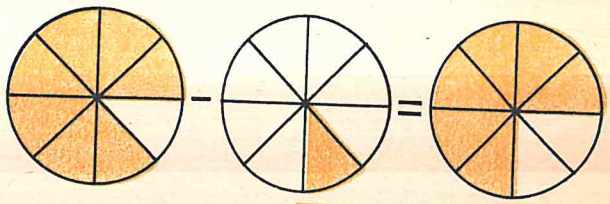
1 whole $- \frac{1}{8} = \frac{\square}{\square}$



$\frac{3}{4} - \frac{1}{4} = \frac{\square}{4} = \frac{\square}{2}$



$\frac{5}{8} - \frac{1}{8} = \frac{\square}{8} = \frac{\square}{2}$



$\frac{7}{8} - \frac{1}{8} = \frac{\square}{8} = \frac{\square}{4}$

1 fourth = $\frac{1}{4}$
1 fourth = $\frac{1}{4}$
+ 1 fourth = $\frac{1}{4}$

☐ fourths = $\frac{\square}{\square}$

---

1 eighth = $\frac{1}{8}$
2 eighths = $\frac{2}{8}$
+ 2 eighths = $\frac{2}{8}$

☐ eighths = $\frac{\square}{\square}$

---

1 eighth = $\frac{1}{8}$
2 eighths = $\frac{2}{8}$
+ 3 eighths = $\frac{3}{8}$

☐ eighths = $\frac{\square}{8}$ = $\frac{\square}{\square}$

---

2 eighths = $\frac{2}{8}$
+ 2 eighths = $\frac{2}{8}$

☐ eighths = $\frac{\square}{8}$ = $\frac{\square}{2}$

---

2 fourths = $\frac{2}{4}$
+ 2 fourths = $\frac{2}{4}$

☐ fourths = $\frac{\square}{4}$ = ☐ whole

---

3 fourths = $\frac{3}{4}$
− 1 fourth = $\frac{1}{4}$

☐ fourths = $\frac{\square}{4}$ = $\frac{\square}{2}$

---

7 eighths = $\frac{7}{8}$
− 1 eighth = $\frac{1}{8}$

☐ eighths = $\frac{\square}{8}$ = $\frac{\square}{4}$

---

5 eighths = $\frac{5}{8}$
− 1 eighth = $\frac{1}{8}$

☐ eighths = $\frac{\square}{8}$ = $\frac{1}{\square}$

---

7 eighths = $\frac{7}{8}$
− 5 eighths = $\frac{5}{8}$

☐ eighths = $\frac{\square}{8}$ = $\frac{1}{\square}$

---

7 eighths = $\frac{7}{8}$
− 3 eighths = $\frac{3}{8}$

☐ eighths = $\frac{\square}{8}$ = $\frac{1}{\square}$

---

3 fourths = $\frac{3}{4}$
+ 2 fourths = $\frac{2}{4}$

☐ fourths = $\frac{\square}{4}$ = ☐ $\frac{\square}{\square}$

# Subtracting from Hundreds

Subtract 500 − 175. Estimate: about 500 − 200 = ☐

500 = 5 hundreds and 0 tens and 0 ones

There are no tens or ones from which we can subtract. To get them, first exchange 1 hundred for 10 tens:

500 = 4 hundreds and 10 tens and 0 ones

**Short Way**

1st step:

$$\begin{array}{r} {\scriptstyle 4\ \ 10} \\ 5\ \ 0\ \ 0 \\ -\ 1\ \ 7\ \ 5 \\ \hline \end{array}$$

Then exchange 1 ten for 10 ones:

500 = 4 hundreds and 9 tens and 10 ones

175 = 1 hundred and 7 tens and 5 ones

500 − 175 = ☐ hundreds and ☐ tens and ☐ ones

= ☐☐☐

2nd step:

$$\begin{array}{r} {\scriptstyle \ \ 9\ \ 10} \\ {\scriptstyle 4\ \ 10} \\ 5\ \ 0\ \ 0 \\ -\ 1\ \ 7\ \ 5 \\ \hline \end{array}$$

3rd step: ☐☐☐

**Subtract in the short way. First exchange 1 hundred for 10 tens.**

| | | | |
|---|---|---|---|
| $\begin{array}{r} 6\ 0\ 0 \\ -\ 1\ 2\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 4\ 0\ 0 \\ -\ 2\ 3\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 7\ 0\ 0 \\ -\ 2\ 6\ 8 \\ \hline \end{array}$ | $\begin{array}{r} 9\ 0\ 0 \\ -\ 4\ 1\ 6 \\ \hline \end{array}$ |
| $\begin{array}{r} 5\ 0\ 0 \\ -\ 2\ 8\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 6\ 0\ 0 \\ -\ 5\ 8\ 6 \\ \hline \end{array}$ | $\begin{array}{r} 5\ 0\ 0 \\ -\ 1\ 9\ 4 \\ \hline \end{array}$ | $\begin{array}{r} 4\ 0\ 0 \\ -\ 3\ 9\ 9 \\ \hline \end{array}$ |
| $\begin{array}{r} 3\ 0\ 0 \\ -\ \ \ 2\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 4\ 0\ 0 \\ -\ \ \ 8\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 8\ 0\ 0 \\ -\ 1\ 1\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 6\ 0\ 0 \\ -\ \ \ 9\ 9 \\ \hline \end{array}$ |

# WORKBOOKS IN THIS SERIES

by Irving Adler, Ph.D.

## MATHEMATICS—GRADE 1

What numbers mean • How numbers are written • What order numbers come in (or how to count) • How to add • How to subtract • How to compare sizes (or what **tall, small, more,** and **fewer** mean) • What **pennies, nickels,** and **dimes** are (or how to use pennies, nickels, and dimes) • How to make change • How to tell the hours on a clock • What a **foot ruler** is • What **triangles, squares,** and **circles** are • What order the days of the week come in • What a **dozen** is.

## MATHEMATICS—GRADE 2

How to count up to 100 • How to add and subtract two-place numbers • How to work problems in your head • What **zero** means • What **half** and **fourth** mean • How to count money • What **quarters** are • How to read a thermometer • How to read a calendar • How to tell time in quarter hours.

## MATHEMATICS—GRADE 3

More about adding and subtracting • How to multiply • How to divide • What **third** means What **dollars** and **half dollars** are • How to use a dollar sign • More about calendars • More about thermometers • How to tell time at five-minute intervals • How to measure with a ruler.

## MATHEMATICS—GRADE 4

How to count up to 100,000 • How to add and subtract three-place numbers • How to multiply a three-place number • How to divide a two-place number • How to write fractions • How to add and subtract fractions • More about thermometers • What **Roman numerals** are • How to work with money up to five dollars • How to use **inches, feet,** and **yards** • How to use **pints, quarts,** and **gallons** • How to use **pounds** and **ounces** • More about clocks and calendars.

## MATHEMATICS—GRADE 5

What fractions are (what fraction means) • How to work with fractions • More about adding and subtracting • More about multiplying and dividing • More about Roman numerals • More about money • What **average** means • More about clocks and calendars (more about time) • More about weight • More about length.

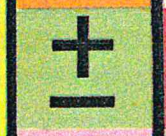
## MATHEMATICS—GRADE 6

How to count up to 100,000,000,000 • More about adding and subtracting • More about multiplying and dividing • More about fractions • What **mixed numbers** are • What **decimals** are • How to use decimals • How to work with **rate, time,** and **distance** • How to find **area** • How to find **perimeter** • How to find **volume** • More about Roman numerals • Some laws of arithmetic.

Name _____

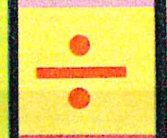
IN THIS WORKBOOK, I WILL LEARN:

how to understand numbers up to 100,000

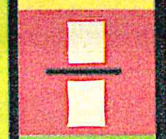


how to add and subtract three-place numbers

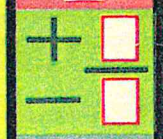
how to multiply a three-place number by a digit



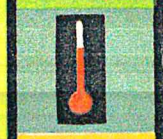
how to divide a two-place number by a digit



how to understand and write fractions



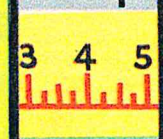
how to add and subtract fractions



more about thermometers

what Roman numerals are

how to work with money up to five dollars




how to use inches, feet, and yards

how to use pints, quarts, and gallons

how to use pounds and ounces

more about clocks and calendars

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